Math Notes Overview

(1) One variable expressions

$5c+4 \quad c=5$

$5(5)+4$

$25+4$

$=29$

(2) Two variable expressions

$xy-y+3x$

$x=3$

$y=2$

$3(2)-2+3(3)$

$6-2+9$

$4+9$

$=13$

(3) Two variable expression w/ fractions and decimals

$7j+5-8k \quad j=\frac{1}{2}, \quad k=0.25$

$7(\frac{1}{2})+5-8(0.25)$

$3\frac{1}{2}+5-2$

$8\frac{1}{2}-2$

$=6\frac{1}{2} / 6.5$

(4) Combine like terms

$2(3x+5)$

$2(3x)+2(5)$

$=6x+10$

⑤ Combine like terms with negative coefficents and distribution

$7(3y-5)-2(10+4y)$

$7(3y)+7(-5)-2(10)-2(4y)$

$21y-35-20-8y$

$=13y-55$

⑥ Combining like terms with negative coefficients

$-3y+4xy-2x^2+2x+y^2-4xy+2y+3x^2$

order the expression and solve

$3x^2-2x^2+y^2+4xy-4xy+2x+2y-3y$

$=x^2+y^2+2x-y$

⑦ Slope formula

$\text{slope}=\frac{y_2-y_1}{x_2-x_1}$ $\frac{\text{rise}}{\text{run}}\left(\frac{y}{x}\right)$ (2,1) (3,4) $\frac{4-2}{3-2}=\frac{2}{1}=2$

⑧ Quadratic formula

$x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$ Ex: $6x^2-17x+12=0$

a) $6=a$ $-17=b$ $12=c$

b) Apply to the equation next

$x=\frac{17\pm\sqrt{289-288}}{12}$

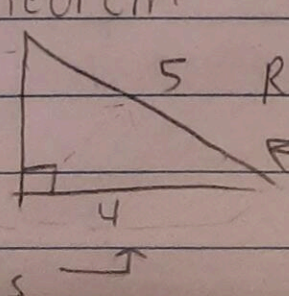
$x=\frac{17\pm\sqrt{1}}{12}$

⑨ Pythagorean Theorem

$a^2+b^2=c^2$

$3^2+4^2=5^2$

$9+16=25$



Right Triangle

hypotenuse

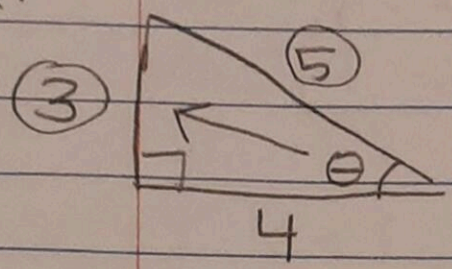
(10) SOHCAHTOA

$SOH = \sin = \frac{\text{opposite}}{\text{hypotenuse}}$ Sine opposite hypotenuse

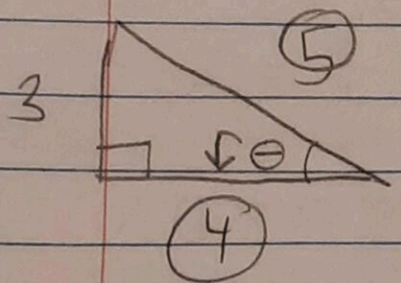
$CAH = \cos = \frac{\text{adjacent}}{\text{hypotenuse}}$ cos adjacent hypotenuse

$TOA = \tan = \frac{\text{opposite}}{\text{adjacent}}$ tan opposite adjacent

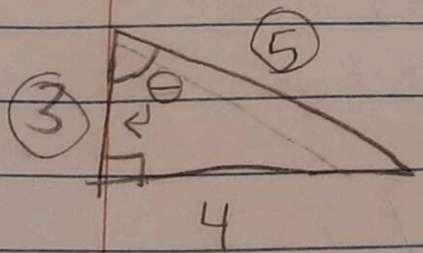
Ex:



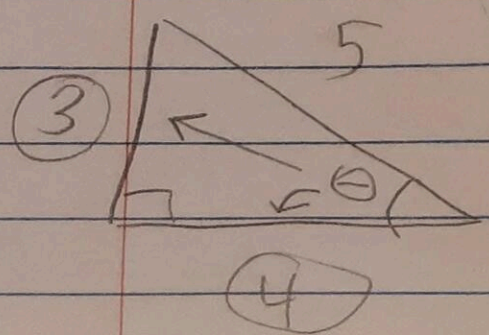
$\sin\theta = \frac{3}{5}$



$\cos\theta = \frac{4}{5}$



$\cos\theta = \frac{3}{5}$



$\tan\theta = \frac{3}{4}$

⑪ FOIL

First Outer Inner Last * used only in bin

a) $(x-2)(x+3)$

x^2

b) $(x-2)(x+3)$

$3x$

c) $(x-2)(x+3)$

$-2x$

d) $(x-2)(x+3)$

-6

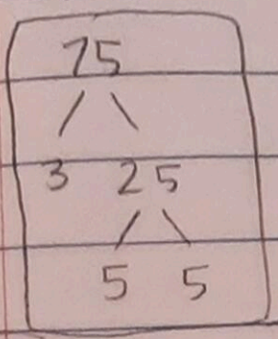
e) Combine all terms

x^2-x-6

⑫ Prime factorization

Find the prime factorization of 75

Use the prime factoring tree

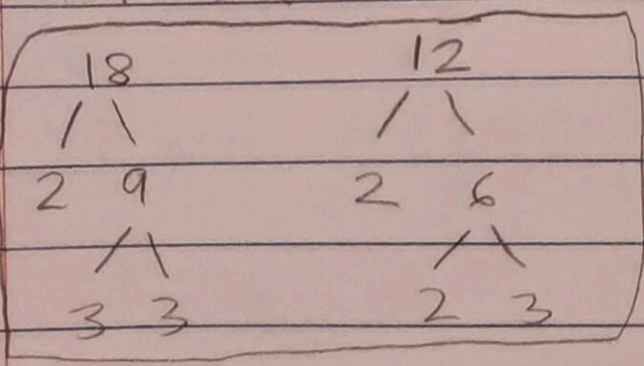


A: $3 \cdot 5^2$

⑬ Least Common Multiple (LCM)

What is the least common multiple of 18 and 12?

Prime factorization tree method



$18 = 2 \times 3 \times 3$

$12 = 2 \times 2 \times 3$

LCM(18, 12) = $2 \times 2 \times 3 \times 3 = \boxed{36}$

12

18

REMEMBER THAT IT IS A MULTIPLYING FACTOR!

⑭ Greatest Common Factor (GCF)

What is the GCF of 12, 8?

12: ①, ②, 3, ④, 6, 12

8: ①, ②, ④, 8

GCF = 4

⑮ Square Roots

Simplify

$\sqrt{4}=2$ $\sqrt{9}=3$ $\sqrt{16}=4$ $\sqrt{25}=5$ $\sqrt{36}=6$

$\sqrt{49}=7$ $\sqrt{64}=8$ $\sqrt{81}=9$ $\sqrt{100}=10$ $\sqrt{121}=11$

$\sqrt{144}=12$ $\sqrt{169}=13$ $\sqrt{196}=14$ $\sqrt{225}=16$

⑯ Inequalities

$$\frac{-0.5x \leq 7.5}{-0.5} = x \geq -2.5$$

IMPORTANT: When dividing or multiplying by a negative number, flip the sign.

$4-6x \geq -14$

-4

$$\frac{-6x \geq -18}{-6}$$

$x \leq 3$

⑰ PEMDAS

Parentheses → Exponets → Multiply or Divide (Left to Right) → Add or Subtract (Left to Right)

$6 \div 2(1+2)$ Add $1+2$ in the parentheses

$6 \div 2\ (3)$ Divide $6 \div 2$

$3(3)$ Multiply 3 by 3

$=9$

(20) System of Equations

$2x + 5y = 33$

$x + 3y = 19$ ← Multiply $\times 2$

Elimination Method

$2x + 5y = 33$ ← multiply $\times -1$

$2x + 6y = 38$

$-2x - 5y = -33$ Subtract both equations

$2x + 6y = 38$

$0 + y = 5$

Substitute 5 into y into either equation

$x + 15 = 19$

-15

$x = 4 \quad y = 5$

$3x + 3y = 18$

$x + 7y = 30$ ← multiply $-3x$

$3x + 3y = 18$

$-3x - 21y = -90$

$0 - 18y = -72$

-18

$y = 4$

$3x + 12 = 18$

-12

$3x = 6$

$x = 2$

(18) Absolute value

$|2| = 2$ $|-2| = 2$ $-|-2| = -2$

$-|2| = -2$

Just think of it as a making any number that has absolute value into its postive form. Expect if the negative sign is outside of the absolute, it is always going to be negative.

(19) Exponets

Evalute 18^2

$18 \times 18 = 324$

$5^2 = 25$

$5^{-2} = 25$

$10^{-3} = -1000$

Exponets are just the base number multiplying the amount of times according to the exponet. Whenever divided, it is subtraction. Whenever multiplied, it is addition

$6^5 \div 6^3 = 6^2$

$6^7 \times 6^5 = 6^{12}$

(21) System of Equation: Word Problem

Kate sells stuffed animals at a local craft show. She charges $13 for the small ones and charges $12 for the large ones. She sold $350 worth of animals after the show, she noticed that she sold 27 stuffed animals how many wee small and large?

a) Determine the unknown and what are you trying to solve for

b) use variables for the unknown

x - # of small sold

y - # of large sold

c) write out the equations

$13x + 12y = 350$

$x + y = 27$

d) Substitute $y = 27 - x$ and plug-in into the other equation

e) Solve

$13x + 12(27 - x) = 350$

$13x + 324 - 12x = 350$

$-324 \quad -324$

$26 + y = 27$

$-26 \quad -26$

$x = 26 \quad y = 1$

(22) Mean, Median, Mode

Find the mean of the following set of #'s:

23, 29, 20, 32, 23, 21, 33, 25

a) Add all #'s together first

23+29+20+32+23+21+33+25=208

b) Divide the total by the amount of #'s in the set.

$$8\overline{)208} = 26$$

mean/average = 26

$-16\downarrow$

48

-48

0

For the median, organize the numbers from least to greatest

20, 21, 23, 23, 25, 29, 32, 33

If there is an even set of #'s take the middle two and add them together. Then you divide it by 2 to get your median.

If there is an odd set of #'s, just find the middle # normally.

To find the mode, it just means find the most reoccuring # in the set, which in this set is 23.

(23) Range and Midrange

Find the range of the # set:

65, 81, 73, 85, (94), 79, 67, 83, 82

Range means subtracting the largest # by the smaller #.

94 - 65 = 29 ← Range

Midrange is the average of both the largest and smallest #'s.

$\frac{94+65}{2} = \frac{159}{2} = 79.5$ ← Midrange

(24) Interquartile Range

Find the IQR in this # set

4, 4, 10, 11, 15, 7, 14, 12, 6

a) orgurize the numbers from least to greatest

4, [4, 6], 7, 10, 11, [12, 14], 15

b) Figure out the averages of the first and last halves

4+6 = 10 ÷ 2 = 5 12+14 = 26 ÷ 2 = 13

c) Find the difference between each half (2nd - 1st)

13 - 5 = 8 ← IQR

(25) Factorials

Factorials are exclamation symbols that look like this: $6!$

To solve this, multiply like this:

$1 \times 2 \times 3 \times 4 \times 5 \times 6 = 720$

Another example:

$3!$

$1 \times 2 \times 3 = 6$

Starting from 1, keep multiplying to the chosen number.

(26) Permutations and Combinations

rmutation A, B, C, D, E

Each letter represents 1 person.

How many ways can you have 5 people in 3 seats?

$\frac{5}{1} \quad \frac{4}{2} \quad \frac{3}{3}$

To solve this, put as many greatest numbers as you can on the seats. Then, you multiply the people in the seats $5 \times 4 \times 3 = 60$

The formula for this is: $nPr = \frac{n!}{(n-r)!}$

Combination is where the order doesn't matter and have fewer outcomes.

Combination formula:

$$nCr = \frac{n!}{r!(n-r)!}$$

* Very complicated to explain

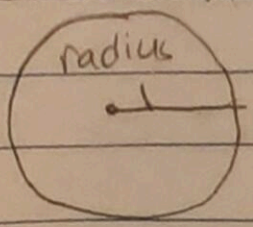
(27) π (pi)

π is a never ending number starting with the digits of 3.14....

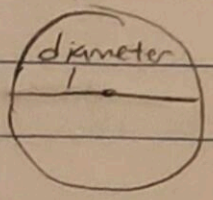
The fraction for π is $\frac{22}{7}$

Used in geometry for some shapes

(28) Area, Radius, Diameter, Circumference of a circle



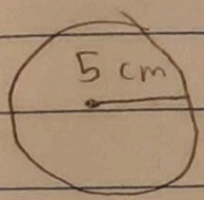
$\frac{1}{2}D = R$



$2R = D$

Circumference formula $= 2\pi r$

Area formula $= \pi r^2$

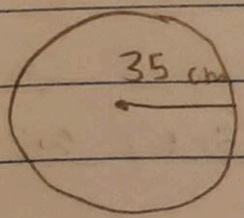


Find circumference

$2(\pi)(5)$

$10\pi = 31.4$ cm.

Find area



$35^2\pi$

$35 \cdot 35 = 1225 \cdot \pi = 3846.5$ cm

(28) Fractions

$\frac{1}{2}$ ← numerator
← denominator

What it looks like: $1 \div 2$

Improper Fraction

$\frac{10}{7}$ A bigger numerator than the denominator

Mixed Fraction

$1\frac{3}{4}$ A whole number with a fraction

Mixed Into Improper

$1\frac{3}{4}$ The denominator multplies the whole number and adds the numerator

$\frac{7}{4}$ ← improper form

The smaller the denominator, the value itself goes down as well.

Simplifying Fractions

$\frac{6}{4}$ Fractions can be simplified if they both have a common multiple.

$\frac{6}{4} \div 2 = \frac{3}{2}$

Adding / Subtracting Fraction

$\frac{7}{4} - \frac{3}{4} = \frac{4}{4} = 1$

$\frac{5}{3} - \frac{1}{9}$ To subtract unlike denominators, find a common multiple. You can change it into a common denominator for both or multiply each denominator by the entire fraction.

$\frac{5}{3} - \frac{1}{9}$ $\quad \frac{15}{9} - \frac{1}{9} = \boxed{\frac{14}{9}}$

↑ x3 This kind of thing can apply for addition as well.

Multiplying / Dividing Fractions

To multiply fractions, multiply numerator by numerator and multiply denominator by denominator

$\frac{5}{9} \times \frac{3}{2} = \frac{15}{18} \div 3 \quad \frac{5}{6}$

To divide fractions, do Keep Change Flip

Keep the First fraction, change the sign, flip (switch) the numerator and denominator.

$\frac{2}{3} \div \frac{1}{4} \quad \frac{2}{3} \times \frac{4}{1} = \frac{8}{3}$

ALWAYS REMEBER TO SIMPLIFY THE ANSWER IF POSSIBLE. If using any of the 4 operation on a whole number, use $\frac{1}{}$ as the denominator and the main # as a numerator.

(29) Ratios and Proportions

Ratios are a comparison of 2 quantities by division.

Order also matters.

20:35 $\quad \frac{20}{35} = \boxed{\frac{4}{7}}$ $\quad$ 20 to 35

(30) Percentages

What percent of 16 is 4?

$\frac{4}{16} = \frac{1}{4} = 4\overline{)1.0}$ (2.5; -8; 20; -20; 0) $\quad 2.5 \cdot 100 = 25\%$

160 is what percent of 80?

$\frac{80x}{80} = \frac{100}{80} \quad x = \frac{100}{80}$ $\quad x = 8\overline{)10.00}$ (1.25; -8; 20; -16; 40; -40; 0)

125%

150 is 25% of what #?

200

$\frac{0.25x}{0.25} = \frac{150}{0.25} \quad \frac{150}{1} \times \frac{4}{3} \quad 150 \times 4 = 600 \quad \frac{600}{3} = 200$

(31) Decimals

More precise like values after the dot in a #

3.25 4.77 5.28

Adding, subtracting, multiplying, and divide is like the same for most numbers without decimals

$$\begin{array}{r} 0.55 \\ -\ 0.23 \\ \hline 0.32 \end{array} \qquad \begin{array}{r} 0.32 \\ +\ 0.66 \\ \hline 0.98 \end{array} \qquad \begin{array}{r} {}^{6}\ {}^{5} \\ 0.98 \\ \times\ 0.07 \\ \hline 0.0686 \end{array}$$

$$0.07 \overline{)\,7.49} \qquad \begin{array}{r} 107 \\ -70\downarrow \\ \hline 49 \\ -49 \\ \hline 0 \end{array}$$

When multiplying, add up the amount of decimal places, and use it in the product. 2 decimals places in each factors means the product has 4 decimals place to the left.

When dividing, move the divisor to the right as many times to make it a whole number. How many times you to the right applies it to the dividend making it moving to the left.

(32) Scientific Notation

Easy to compare when you have a large or negatively large value of zeros.

125000000

a) Make sure to shift the decimal in between the ones and tens place

1.2500000

b) Then, write how many places were moved like this: 10^8

c) Combine the above two by multiplying it

1.25×10^8

(33) Simple Interest

Formula: $I = PRT$

I = final amount

P = initial principal balance

r = annual interest rate

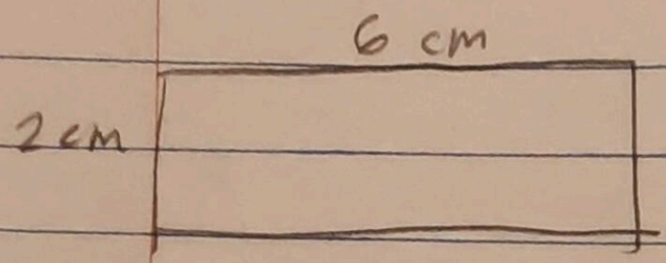
t = time (in years)

Ex: Sarah deposits $4000 at a bank at an interest rate of 4.5% per year. How much interest will she earn at the end of 3 years?

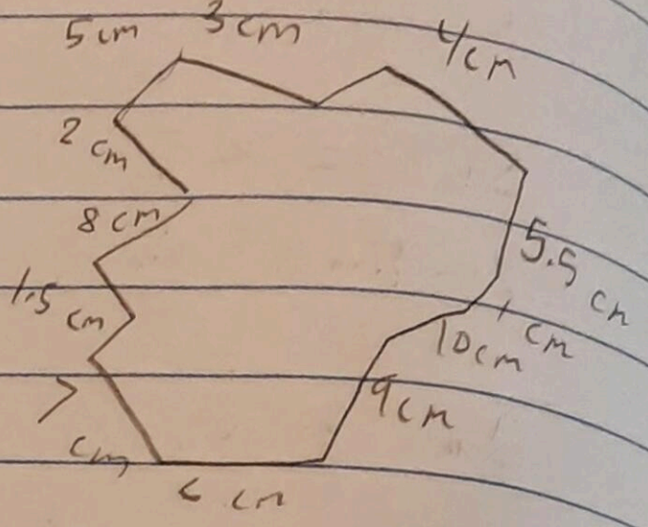
$4000 \times 4.5\% \times 3 = \$540$

(36) Perimeter of 2D shapes

To find the perimeter of 2D shapes, simply add all sides.



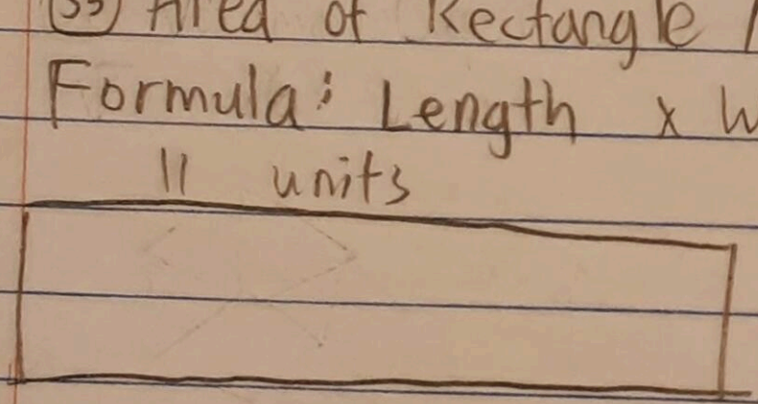
$6+6+2+2 = 16$ cm



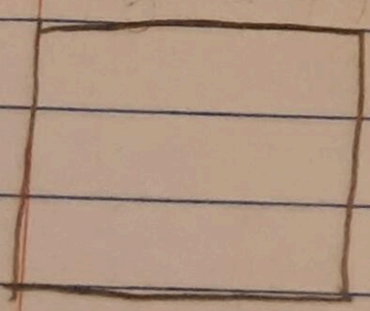
$1+1.5+2+3+4+5+5.5+6+7+8+9+10 = 62$ cm

(35) Area of Rectangle / Square

Formula: Length x Width / s^2



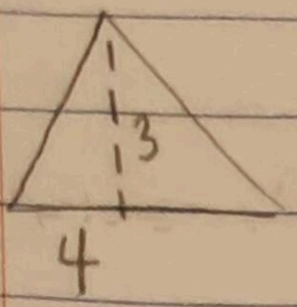
$11 \times 2 = 22$ units^2



$5^2 = 25$ in^2

(40) Area of Triangle

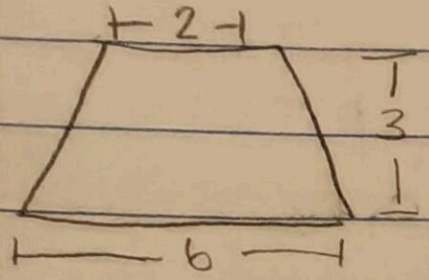
Formula: $bh\frac{1}{2}$



$4 \times 3 \times \frac{1}{2} = 6$

(41) Area of Trapezoid

Formula: $A = \frac{a+b}{2}h$



$A = 2 + 6 = 8$

$8 \div 2 = 4$

$4 \times 3 =$

$12 = A$

(42) Slope of A Line

Formula: $m = \frac{\text{rise}}{\text{run}} = \frac{y_2 - y_1}{x_2 - x_1}$

What is the slope of the line through $(1, -1)$ and $(5, -7)$?

$$\frac{-7 + (1)}{5 - 1} = \frac{-6}{4} \div 2 = \boxed{\frac{3}{2}}$$

(43) Slope Intercept Form

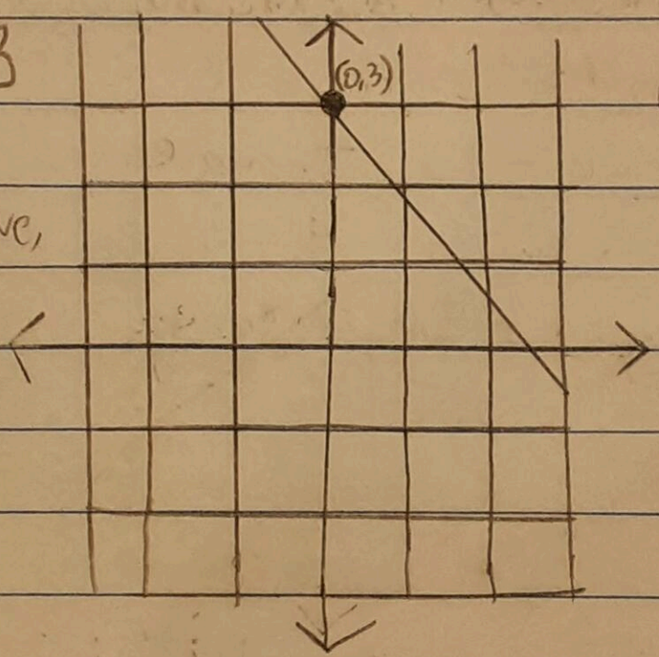
Formula: $y = mx + b$

Write the equation of the line in slope-intercept form with a slope of -5 and y-intercept of 3.

slope ↓

$y = mx + b$ ← y-intercept

$y = -5x + 3$



Graph

Since x is negative, the slope is decreasing.

(44) Multi-Units Conversions

How many seconds in 4 hours?

60 minutes (min) = 1 hour (hr) | 60 seconds (sec) = 1 minute (min)

$4 \text{ hours} \times \frac{60 \text{ minutes}}{1 \text{ hour}} = 240 \text{ minutes} \times \frac{60 \text{ seconds}}{1 \text{ minutes}} =$

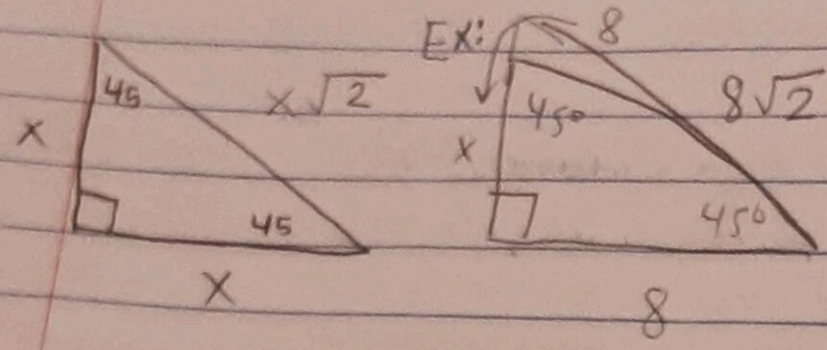
14,400 sec

OR...

$\overset{2}{3600} \times \frac{4}{1}$

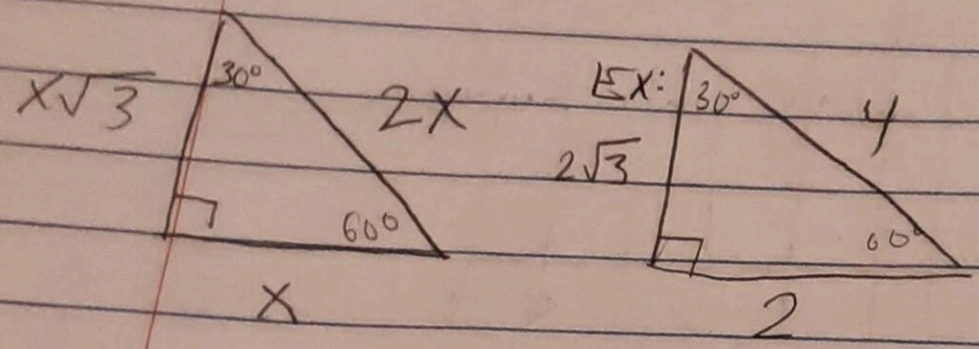
14400

(45) 45-45-90 Triangle



Legs are both X. The hypotenuse is $x\sqrt{2}$

(46) 30-60-90 Triangle

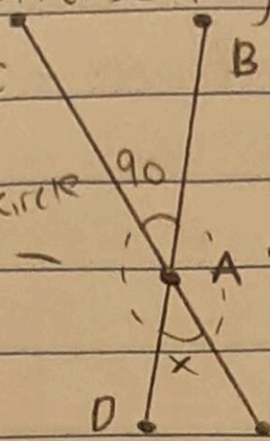


$2 = x$

$x\sqrt{3} = 2\sqrt{3}$

$2 \cdot 2 = 4$

(48) Intersecting Lines



360° = circle

← A is the intersecting point

what is x?

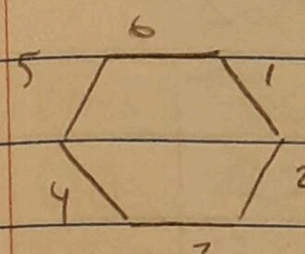
90°

The opposite side equals to the same value on the other side.

(49) Interior Angles

Formula: $(n-2) \times 180$

Find the interior angles on a hexagon



$(6-2) \times 180 =$

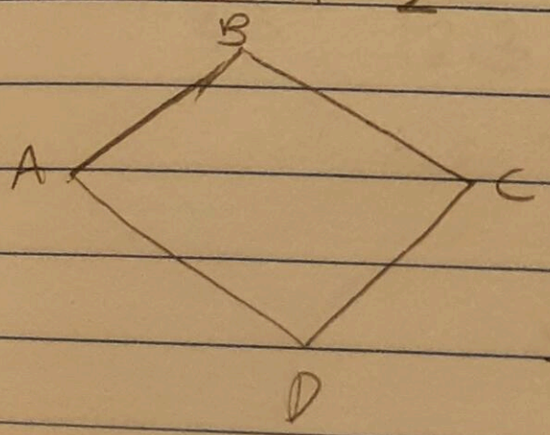
$4 \times 180 =$

$720°$

$$\begin{array}{r} 3 \\ 180 \\ \times \quad 4 \\ \hline 720 \end{array}$$

(50) Area of a Rhombus

Formula: $A = \frac{pq}{2}$



$p = 15$

$q = 12$

$$\begin{array}{r} 1 \\ 15 \\ \times 12 \\ \hline 30 \\ +150 \\ \hline 180 \end{array}$$

$\frac{180}{2} = 90$

$A = 90$

(51) Rates

Nikola buys a bouquet of 8 sunflowers of $18. What is the cost of 1 sunflower?

$$8\overline{)1800} = 2.25 \quad \$2.25$$

$-16\downarrow$

$20\downarrow$

-16

40

-40

0

Miranda's Maid Service charges $280 to clean 8 offices. What is the company's price for cleaning a single office?

$$\frac{280 \text{ dollars}}{8 \text{ offices}} = \$35 \text{ per office}$$

$$8\overline{)280} = 35$$

$-24\downarrow$

40

-40

0

(52) Two Way Table

A survey is carried on students and teachers, asking them whether they prefer football or croquet. Complete the following two-way table.

	Football	Croquet	Total
Students	33	(54)	(87)
Teachers	(68)	1	69
Total	(101)	55	(156)

← 69 - 1 = 68

33 + 68 =

$$\begin{array}{r} {}^{1}33 \\ +\ 68 \\ \hline 101 \end{array}$$

55 - 1 = 54

$$\begin{array}{r} 101 \\ +\ 55 \\ \hline 156 \end{array}$$

156 - 69 =

$$\begin{array}{r} {}^{14}\cancel{15}\,{}^{1}6 \\ -\ 69 \\ \hline 87 \end{array}$$

	Science	Math	Total
Boys	50	48	98
Girls	23	75	98
Total	73	123	196

98 - 50 = 48

23 + 75 = 98

$$\begin{array}{r} {}^{1}98 \\ +\ 98 \\ \hline 196 \end{array}$$

$$\begin{array}{r} 73 \\ -\ 50 \\ \hline 23 \end{array}$$

$$\begin{array}{r} {}^{1}48 \\ +\ 75 \\ \hline 123 \end{array}$$

$$\begin{array}{r} 123 \\ +\ 73 \\ \hline 196 \end{array}$$

(53) Dilation

Dilation is a strech or shrink of an image.

Strech - make it larger

shrink - make it smaller

Dilation is not a change in orientation or shape!!

Scale Factor

$k > 1$

k is greater than 1.

It streches the shape.

$k = 1$

Nothing happens and nothing is changed

$k < 1$

k is less than 1.

It shrinks the shape.

Dilating a Shape D_2 ← scale factor

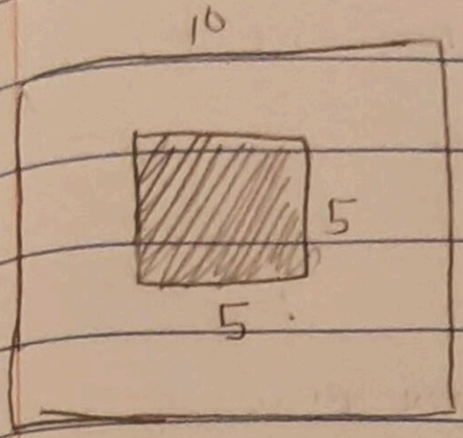
$O(-4, 1)$ $M(3, 2)$ $G(2, -2)$

(×2 ×2) (×2 ×2) (×2 ×2)

↓ ↓ ↓ ↓ ↓ ↓

$O(-8, 2)$ $M(6, 4)$ $G(4, -4)$

(54) Area of Shaded Region



$10 \times 8 = 80$

$5 \times 5 = 25$

65

Find the area of both squares. Subtract the non-shaded square by the shaded square to get the area of the shaded region.

(55) Tax, Discount and Tip

Casey buys a bracelet. She pays for the bracelet and pays $0.72 in sales tax. The sales tax rate is 6%.

What is the original price of the bracelet, before tax?

Sales tax = rate x orginal price

$0.72 = 6\% \times P$

$\frac{0.72 = 0.06p}{0.06}$

$12 = p$

→

A store has 25% off sale on coats. With this discount, the price of one coat is $34.50.

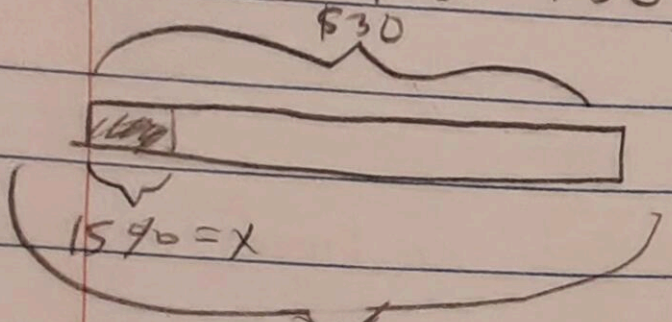
What is the original price of the coat?

100% (Original Price) − 25% (orginal price) = 34.50

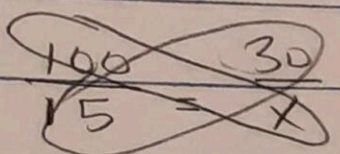
$$\frac{75\%\text{ (orginal price)}}{0.75} = \frac{\$34.50}{0.75} = \boxed{\$46}$$

What is a 15% tip on a meal that costs $30?

(15% tip on $30)



Cross multiply



$$\frac{15}{\times\ 30}$$
$$450$$

$$\frac{450 = 100x}{100}$$

Formula

$$\frac{100}{1} \times \frac{\text{part}}{\text{whole}}$$

4.5 + 30 = 34.5

(56) Cube Roots

$\sqrt{8} = 2$ $\sqrt{27} = 3$ $\sqrt{64} = 4$ $\sqrt{125} = 5$

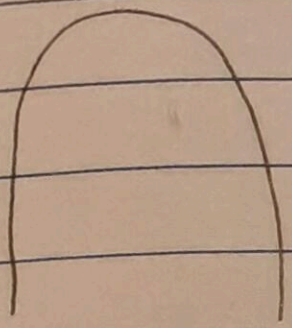
$\sqrt{216} = 6$ $\sqrt{343} = 7$ $\sqrt{512} = 8$ $\sqrt{729} = 9$

$\sqrt{1000} = 10$ $\sqrt{1331} = 11$ $\sqrt{1728} = 12$ $\sqrt{2197} = 13$

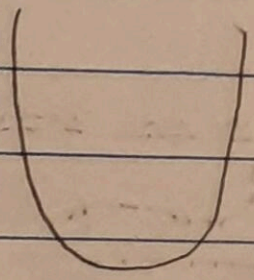
$\sqrt{2744} = 14$ $\sqrt{3375} = 15$

(57) Graphing

A parabola is when you see a curve on the graph



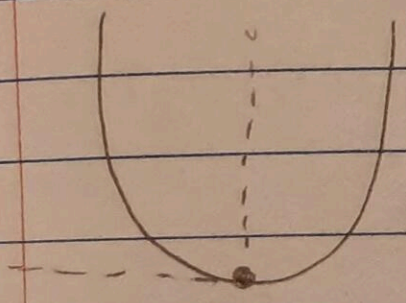
Open downwards



open upwards

Vertex

Max or min point of a parabola



open upwards

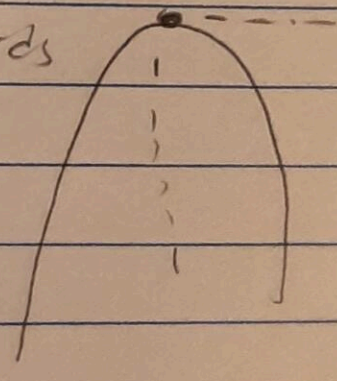
minimum

Vertex:

open downwards

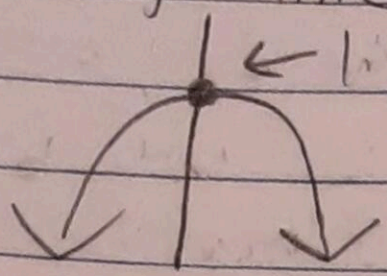
maximum

vertex

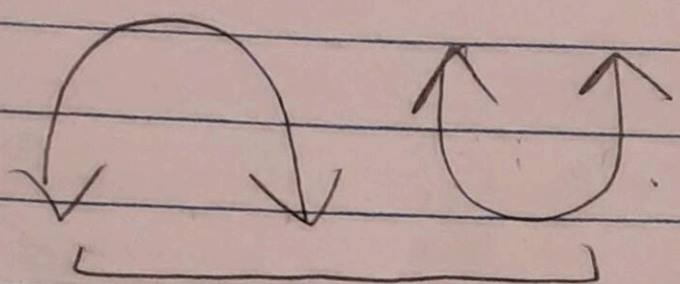


Line of Symmetry

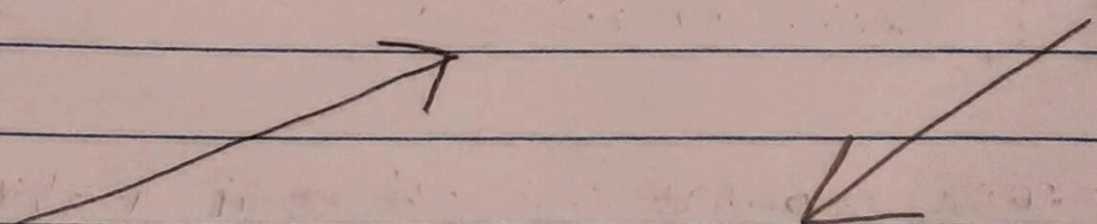
Whenever there is a vertex, you can draw a straight line through the vertex



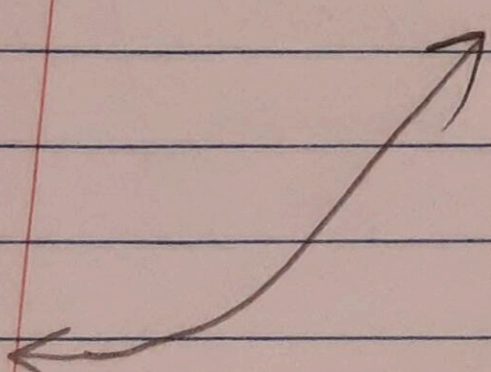
Types of Graphs



Parabola - makes a n or u shape.



Linear Graph
always a straight line



Quadratic
a curve going down or up

(58) Functions, Domain, Range

$f(x) = 4$

The range is asking for the y-values

It is fine to have the same y-value.

It is NOT a function when you have the same x-value. Do not repeat the same value.

Domain

Domains are asking for the x-values instead.

What is the domain of the function $h = \{(2,5), (4,17), (7,50)\}$?

$\{2, 4, 7\}$

x-values

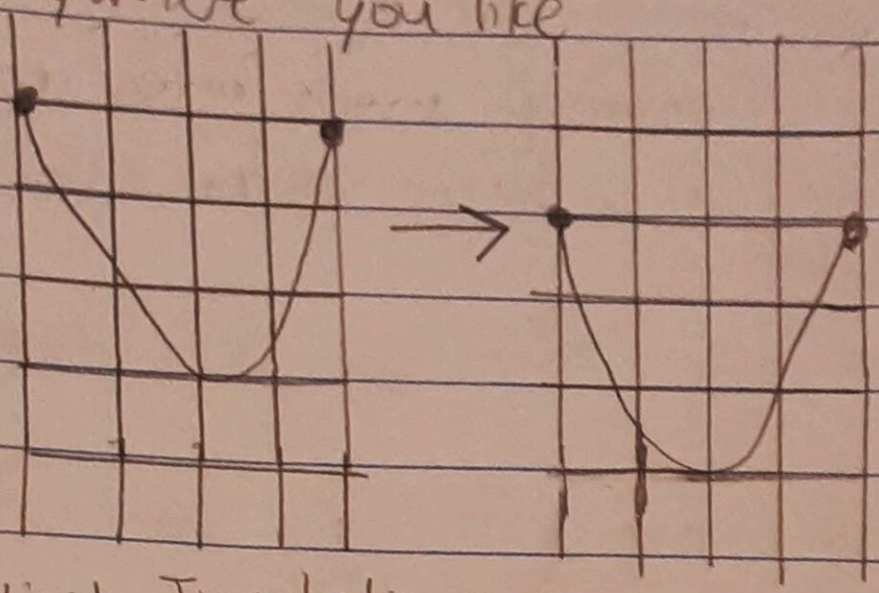
What is the range of the function?

$f = \{(2,5), (3,7), (6,5)\}$?

Since, there are only 2 different y-values the answer would be $\{5, 7\}$.

(59) Function Translation

Translations are moving the line to anywhere you like



Vertical Translation
Move the line downwards or upwards

Horizontal Translation
Move the line left or right.

$f(x)+n$	$f(x+n)$ $n=\#$
VERTICAL	HORZINTAL
UP	RIGHT

$f(x)-n$	$f(x-n)$
VERTICAL	HORZINTAL
DOWN	LEFT

(60) Sequences

There are 2 types of sequences, arithmetic and geometric.

Sequence Notation

To notate a sequence, people often use the letter a and put a letter on the base of a.

3, 7, 11, 15, (19)
1 2 3 4 5

$a_5 = 19$

Arithmetic Sequence

40, 32, 24, 16
-8 -8 -8 -8

It can be identified by subtracting or adding number after number on the number set.

Geometric Sequence

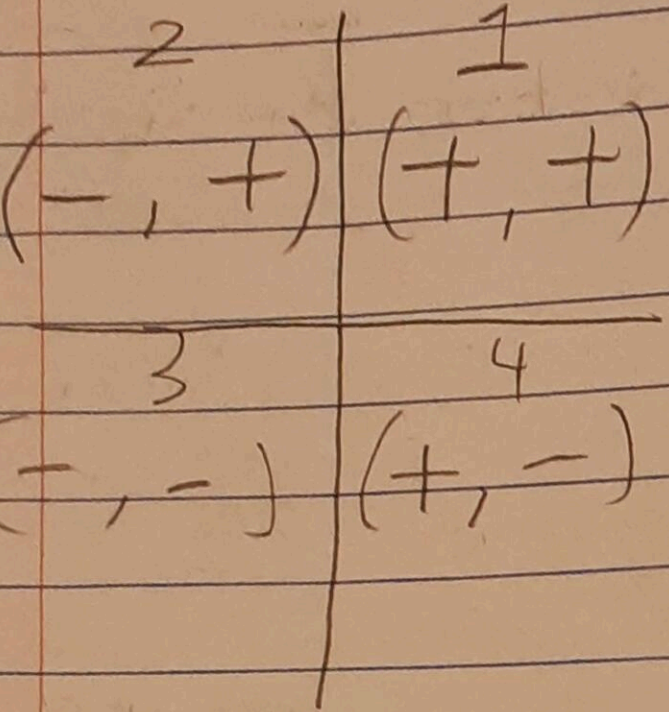
3, 6, 12, 24, 48
×2 ×2 ×2 ×2 ×2

It can be identified by multiplying or dividing number after number on the number set.

A sequence that is losing value means it is a decreasing sequence. A sequence that is gaining value means it is an increasing sequence.

(61) Quadrants

There are four quadrants in total on the coordinate grid.



Quad. 1 has all positive values and is located on the top right.

Quad 2 has a negative x-value and positive y-value. It is located on the top left.

Quad. 3 has all negative values and is located on the bottom left.

Quad. 4 has positive x-value and negative y-value. It is located on the bottom right.

Formula

$Q_3 + 1.5(IQR)$

$Q_1 - 1.5(IQR)$

(62) Outlier

An outlier is an extremely high or extremely low value in our data.

It is identified by the outlier being greater than $Q_3 + 1.5(IQR)$ or lower than $Q_1 - 1.5(IQR)$.

Phone calls recieved

10, 12, 11, 15, 11, 14, 13, 17, 12, 22, 14, 11

Q = Quartile

10

11 $11+11=22\div2=11$

11 $Q_1 = 11$

11

12 $14.5-11=3.5$

12

13

14 $14+15=29\div2=14.5$

14 $Q_3 = 14.5$

15

17

22

$14.5+1.5(3.5)=19.75$

$11-1.5(3.5)=5.75$

Any larger than 19.75, it is an outlier.

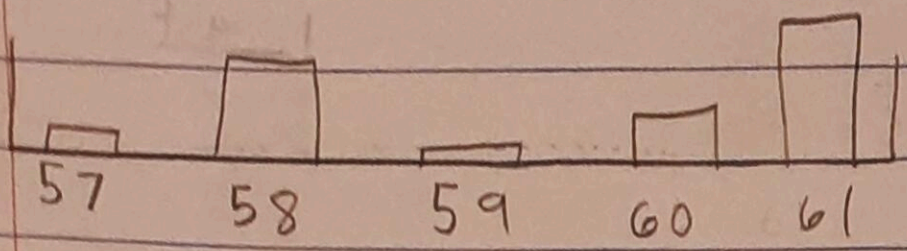
Any smaller than 5.75, it is an outlier

(22) is the only outlier since it is greater than 19.75.

(63) Plots

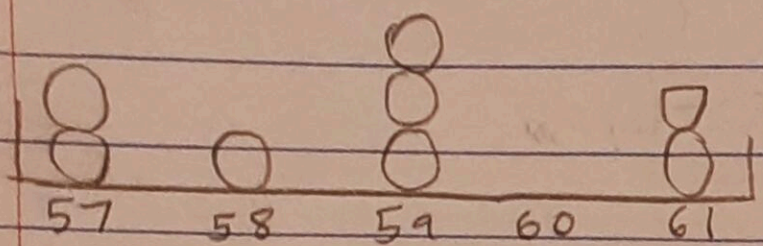
Histogram

Data is represented by rectangles



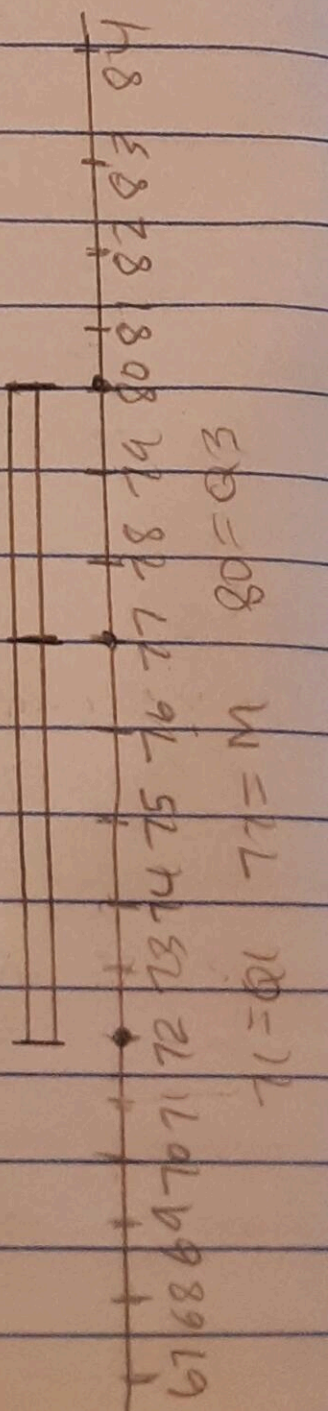
Dot Plots

Data is represented by circles

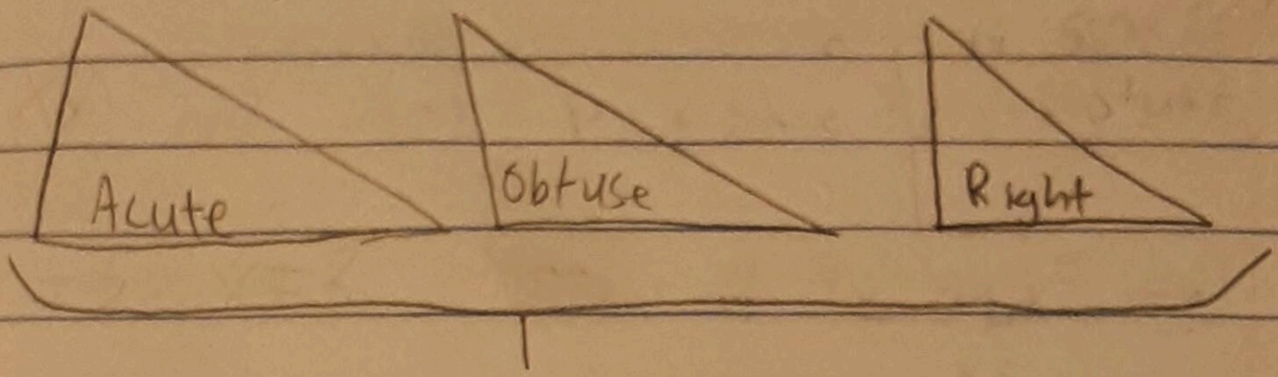


Box Plots

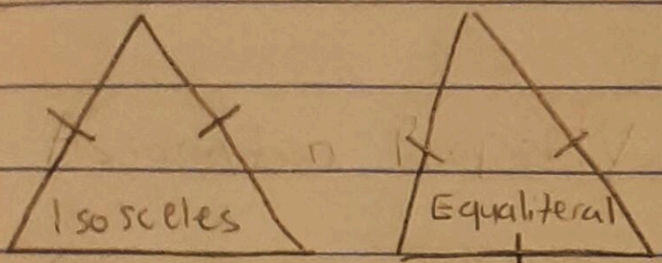
The marked 6th point is always the first quartile. The second the median. The third, third quartile 3.



(64) Triangles



Scalene triangles



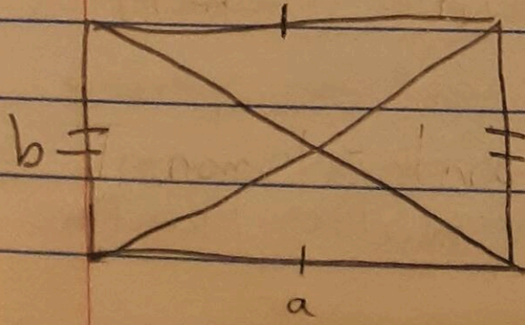
2 equal sides

All sides are equal

(77) Rectangles

A rectangle is a parallelogram with four right angles.

- opposite side congruent
- all angles are right angles
- diagonals are congruent
- diagonals bisect each other



Ex: The area of the rectangle with one side of 8 in is 48 in^2. What is the length of the diagonal of the rectangle?

① Find the area

$48 = 8b \rightarrow \frac{48}{8} = \frac{8b}{8} \rightarrow 6 = b$

② Use the pythagorean theorem

$d^2 = 6^2 + 8^2 = 36 + 64 = 100$ $\sqrt{100} = 10$ in

(65) Type of Decimals

47.5
↑
decimal

Terminating Decimals
Does not go on and on. It stops there at the exact value.
98.678
34.9807

Non-Terminating Decimals
Infinitely going on and on; does not stop at all.

example: $\pi = 3.14...$

Repeating Decimals
Repeats the same digits and does not stop

$4.787878 = 4.\overline{78}$ ← can be written like this

Non-Repeating Decimals
Non-teriminating and non-repeating decimals

56.78965...
789009.97658...
45.7789...

(66) Conversion From Fractions To Decimals
To convert, let's view an example.

$\frac{11}{25}$ → $25\overline{)11}$ → Start Dividing to convert into decimal

$$\begin{array}{r} 0.44 \\ 25\overline{)11.00} \\ -100\downarrow \\ \hline 100 \\ -100 \\ \hline 0 \end{array}$$

$\frac{11}{25} = 0.44$

(67) Conversion from Decimals to Fractions
Convert 0.625 to a fraction.
1) Put 0.625 over one. $\frac{0.625}{1}$

2) Multiply the decimal by how many places away and then multiply again by 10.
In this case, it would be 1000. →

$\frac{0.625}{1} \times 1000 = \frac{625}{1000}$

3) You would need to simplify further if needed, to get the correct fraction.

$\frac{625}{1000} \div 25 = \frac{25}{40} \div 5 = \frac{5}{8}$

(68) Replacement Probability (difficult topic)
To find the probability with replacement, understand the meaning.

With replacement means to put the thing back in.

With no replacement, it means not putting the thing back inside.

Ex: 5 blue marbles, 6 red marbles, 4 green marbles (with replacement)

Add all marbles: $5+6+4=15$ marbles

To find the prob. do it like this

$\frac{6}{15} \cdot \frac{5}{15} \cdot \frac{4}{15} = \frac{120}{3375} \div 15 = \frac{8}{225}$

red blue green ↑ simplify

Without Replacement

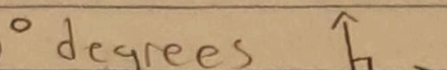
$\frac{6}{15} \cdot \frac{5}{14} \cdot \frac{4}{13} = \frac{120}{2730} \div 30 = \frac{4}{91}$

red blue green

You don't put back the marble, so -1 for the total and the denominator.

(69) Angles

Acute Angle - Angles less than 90° degrees

Right Angle - 90° degrees 

Obtuse Angle - Angles greater than 90° degrees

Straight Angle - 180° degrees

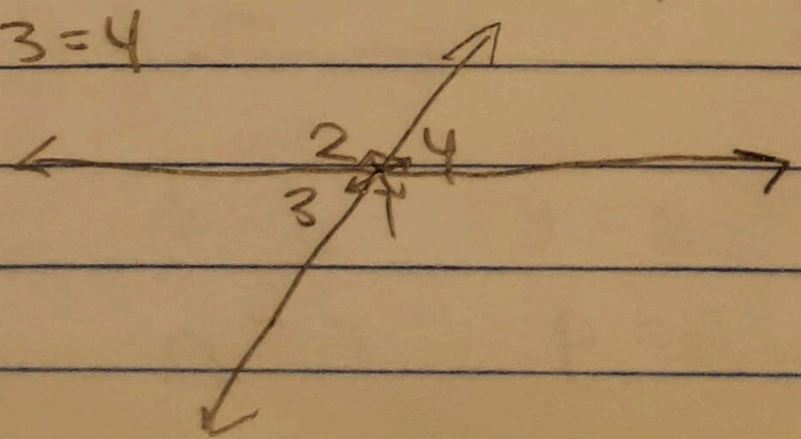
Reflex Angle - Greater than 180° degrees
Less than 360° degrees

Complementary Angle - Angles that add up to 90° degrees

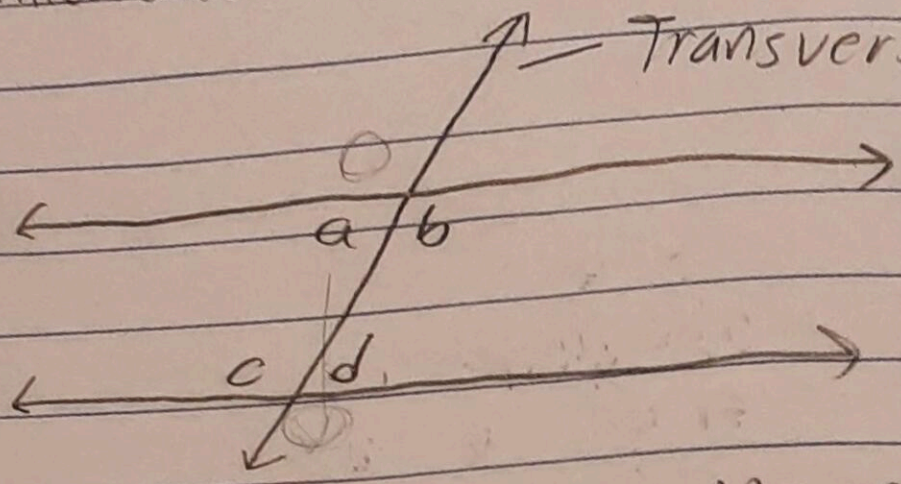
Supplementary Angles - Angles that add up to 180° degrees

Vertical Angles - Common vertex and side of angle are formed by the same lines

1=2 3=4



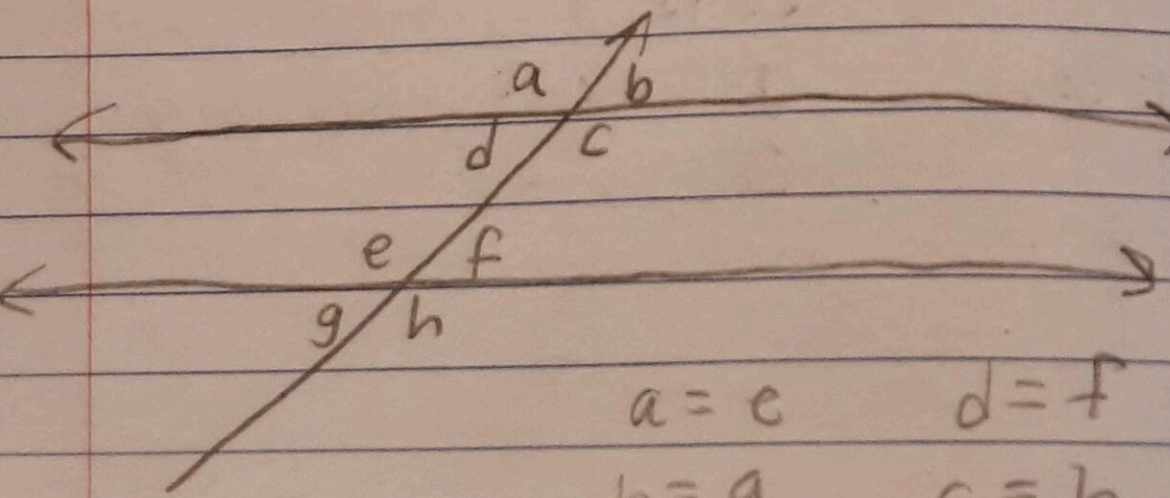
Alternate Interior Angle - Formed when two parallel or non-parallel lines are intersected by a transversal.



c=b Is interchangable and equals
a=d

Alternate Exterior Angle - Same thing as before but on the outside.

Corresponding Angle - Same thing as before with more angles.



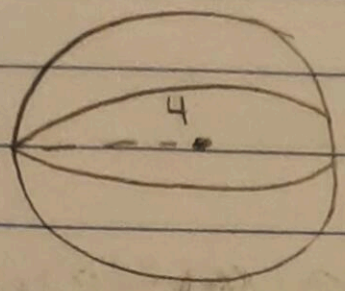
a=e d=f
b=g c=h

(70) Volume and Surface Area of 3D Shapes

Volume of Sphere

$V = \frac{4}{3}\pi r^3$

Ex:



$r = 4$

① $4 \times 4 \times 4 = 64$

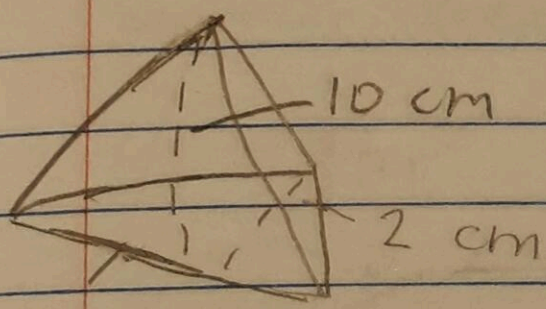
② $\frac{4}{3} \times \frac{64}{1} = \frac{256}{3}$

③ $\pi \cdot \frac{256}{3} = \frac{256}{3}\pi$

④ $V = \frac{256}{3}\pi$

Volume of Triangular Pyramid

$V = \frac{1}{3}Ah$



① $6 \times 2 = 12$

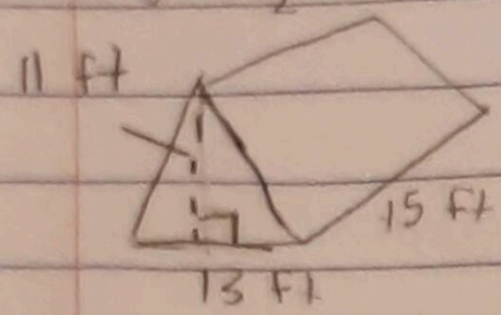
② $12 \div \frac{1}{2} = 6$

③ $6 \cdot 10 = 60$

④ $60 \cdot \frac{1}{3} = 20$

Volume of Triangular Prism

$V = \frac{1}{2}bhl$



① $11 \cdot 13 = 143$

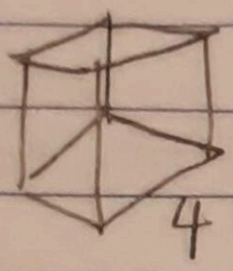
② $143 \cdot 15 = 2145$

③ $2145 \cdot \frac{1}{2} = 1072.5$ ft³

④ $V = 1072.5$ ft³

Volume of Cube

$V = s^3$

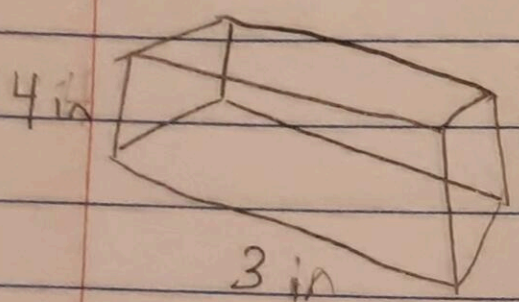


① $4 \cdot 4 \cdot 4 = 64$

② $V = 64$ ft³

Volume of Rectangular Prism

$V = lwh$



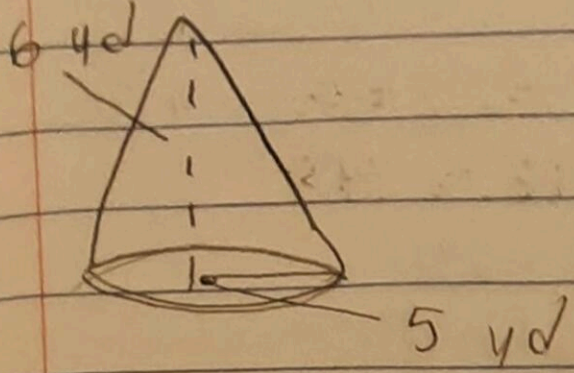
① $4 \cdot 3 = 12$

② $12 \cdot 5 = 60$

③ $V = 60$ in³

Volume of cone

$V = \pi r^2 \frac{h}{3}$



① $\frac{6}{3} = 2$

② $5^2 = 25$

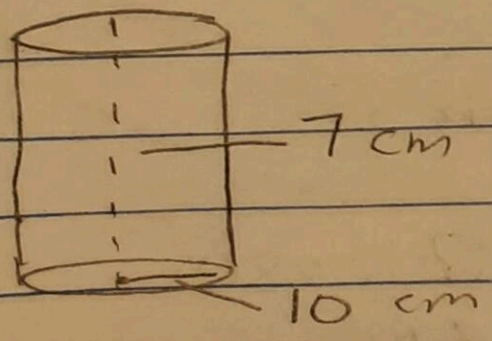
③ $25 \cdot 6 = 150$

④ $\pi \cdot 150 = 150\pi$

⑤ $V = 150\pi \text{ yd}^3$

Volume of Cylinder

$V = \pi r^2 h$



① $10^2 = 100$

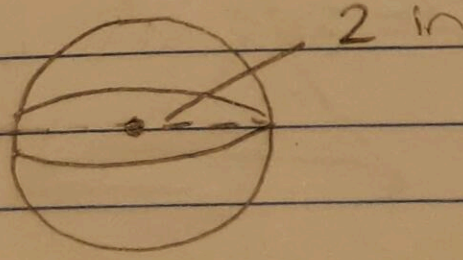
② $100 \cdot 7 = 700$

③ $700 \cdot \pi = 700\pi$

④ $V = 700\pi \text{ cm}^3$

Surface Area of Sphere

$SA = 4\pi r^2$



① $2^2 = 4$

② $4 \cdot 4 = 16$

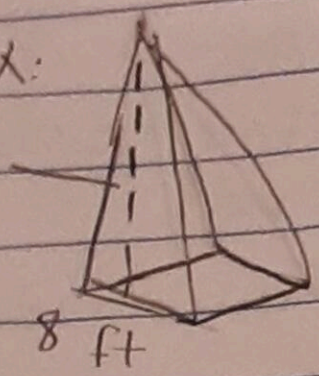
③ $16 \cdot \pi = 16\pi$

④ $SA = 16\pi \text{ in}^2$

Surface Area of Triangular Pyramid

$SA = \text{Base Area} + \frac{1}{2}(P + H)$

EX:



① $8 \times 4 = 32 = P$

② $32 + 16 = 48$

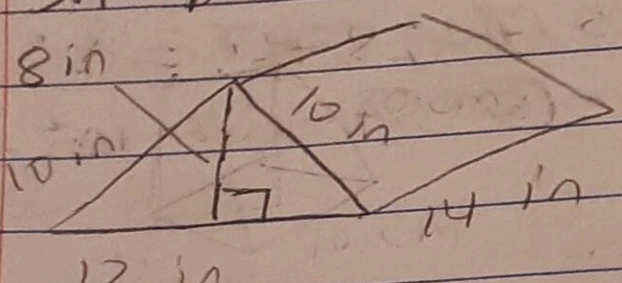
③ $48 \cdot \frac{1}{2} = 24$

④ $8 \cdot 8 = 64 = BA$

⑤ $24 + 64 = 88$ ft²

Surface Area of Triangular Prism

$SA = bh + h(s_1 + s_2 + s_3)$



① $12 \cdot 8 = 96$

② $8 \cdot 10 = 80$

③ $8 \cdot 10 = 80$

④ $8 \cdot 14 = 112$

⑤ $80 + 80 = 160$

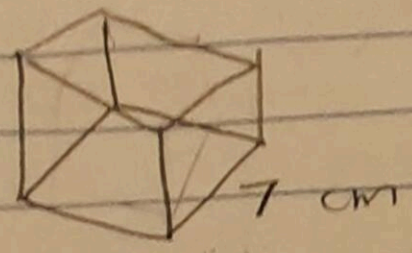
⑥ $160 + 112 = 272$

⑦ $272 + 96 = 368$

⑧ $SA = 368$ in²

Surface Area of Cube

$SA = 6s^2$



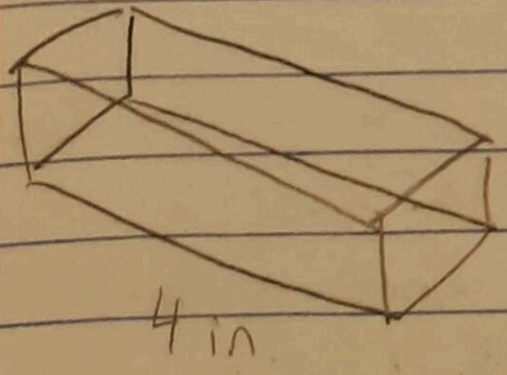
① $7^2 = 49$

② $49 \cdot 6 = 294$

③ $V = 294\ cm^2$

Surface Area of Rectangular Prism

$SA = 2(wl + hl + hw)$



$l = 4$

$w = 5$

$h = 3$

① $2((4 \cdot 5) + (4 \cdot 3) + (5 \cdot 3))$

② $(8 \cdot 10) + (8 \cdot 6) + (10 \cdot 6)$

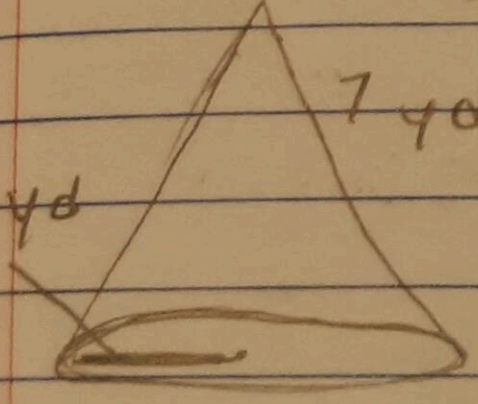
③ $80 + 48 + 60$

④ $128 + 60 = 188$

⑤ $SA = 188\ in^2$

Surface Area of Cone

$SA = \pi rs + \pi r^2$



① $2 \cdot 7 = 14$

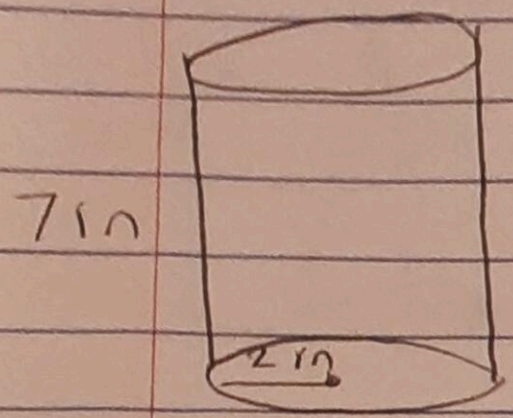
② $7^2 = 4$

③ $14\pi + 4\pi = 18\pi$

④ $SA = 18\pi\ yd^2$

Surface Area of Cylinder

$$SA = 2\pi rh + 2\pi r^2$$



1. $7 \cdot 2 = 14$
2. $14 \cdot 2 = 28$
3. $2^2 = 4$
4. $4 \cdot 2 = 8$
5. $28\pi + 8\pi = 36\pi$
6. $SA = 36\pi \text{ in}^2$

(11) Center of A Circle

$$(x-h)^2 + (y-k)^2 = r^2$$

Ex: $x^2 + y^2 + 4x - 10y - 7 = 0$

$(x+4)^2 = x^2+8x+16$

① $x^2+y^2+4x-10y-7=0$

Rearrange

② $(x^2+4x)+(y^2-10y)-7=0$

Add 7 on other side $+7 \quad +7$

③ $(x^2+4x)+(y^2-10y)=7$

Divide by 2

④ $(x+2)^2+(y-5)^2=7+\boxed{29}$

Square it

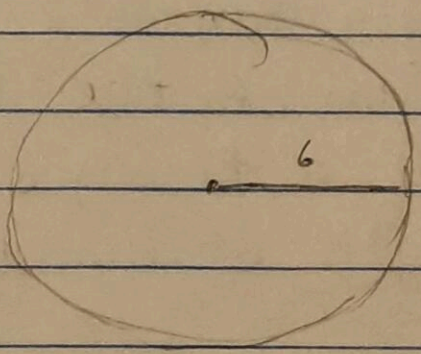
⑤ $(x+4x+4)+(y^2-10y+25)=7+29$

⑥ $(x^2+4x+4)+(y^2-10y+25)=36$

⑦ $(x-2)^2+(y-5)^2=36$

⑧ $6^2=36$

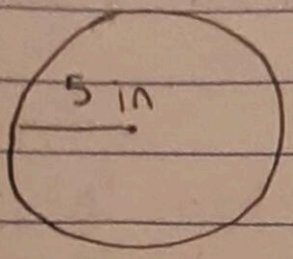
⑨ $r^2=36$



(72) Revolution

(1) Find circumference of a circle.

$2\pi r$



The bike travels 120 in How many revolution until it reach 120? Round to the nearest revolution.

4 revolutions

(2) $5 \cdot 2\pi = 10\pi$

(3) $10\pi = 31.4$

(4) $120 \div 31.4 = 3.8$

(5) $3.8 \approx 4$

(6) 4 revolutions

Ed has 6 more quarters than dimes. The total value of his coins is $6.05. Find how many of each coin Ed has.

type of coin	unit value	how many	Value
Dimes	10	D	10D
Quarters	25	D+6	25(D+6)
Total value of coins		→	605

① $100 + 25(D+6) = 605$

② $100 + 25D + 150 = 605$

③ $350 + 25D = 605$

④ $25D = 255$

⑤ $D = 10.2$

(73) Work Word Problems

$\frac{T}{A} + \frac{T}{B} = 1$

T = time working together

A = time person A working alone

B = time person B working alone

EX: Walter and Helen are asked to paint a house. Walter can paint the house by himself in 12 hours and Helen can paint the house in 16 hours. How long would it take to paint the house if they worked together?

① $\frac{T}{12} + \frac{T}{16} = 1$

② $48\left(\frac{T}{12} + \frac{T}{16} = 1\right)$

③ $4T + 3T = 48$

④ $7T = 48$

⑤ $\frac{48}{7} = T$

⑥ Together $= \frac{48}{7} \approx 6.9$ hours

Ex 2: Tom and Jerry have to stuff and mail 1000 envelopes for a new marketing campaign. Jerry can do the job alone in 6 hours. If Tom helps, they can get the job done in 4 hours. How long would it take Tom to do the job by himself?

① $\frac{4}{A} + \frac{4}{6} = 1$

② $6A\left(\frac{4}{A} + \frac{4}{6} = 1\right)$

③ $24 + 4A = 6A$

④ $24 = 2A$

⑤ $12 = A$ Tom = 12 hours

(74) Coin Word Problem

Martin has a total of 19 nickels and dimes worth $1.65. How many of each type of coin does he have?

	# of coins	x	value of each coin	=	total value
nickels	x		5		5x
dimes	19 − x		10		10(19 − x)
					165

① $5x + 10(19 - x) = 165$

② $5x + 190 - 10x = 165$

③ $-5x + 190 = 165$
$\quad -190$

④ $-5x = -25$

⑤ $x = 5$

(75) Reflections

When reflected across x-axis, the y-coordinate becomes the opposite.

Ex: $(x, y) \rightarrow (x, -y)$

When reflected across the y-axis, the x-coordinate becomes the opposite.

Ex: $(x, y) \rightarrow (-x, y)$

When reflected across the origin, both the x and y coordinates become the opposite

Ex: $(x, y) \rightarrow (-x, -y)$

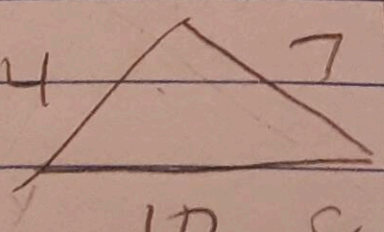
(76) Triangle Inequality Theorem

The sum of the lengths of any two sides of a triangle is greater than the length of the third side.

$a + b > c$

$a + c > b$

$b + c > a$

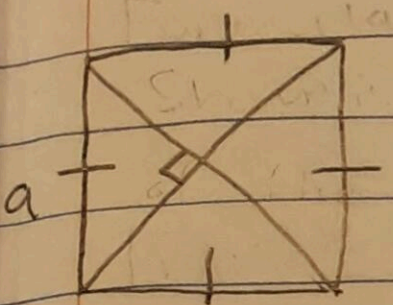


$4 + 7 = 11 > 10$

(78) Squares

A square is a rectangle with all congruent sides.

- all sides are congruent
- all angles are right angles
- diagonals are congruent
- diagonals bisect each other
- diagonals are perpendicular and splits the square into four congruent right triangles



EX: What is the area of the square with diagonal of $12\sqrt{2}$ cm?

$d = 12\sqrt{2}$ cm

$s = 12$

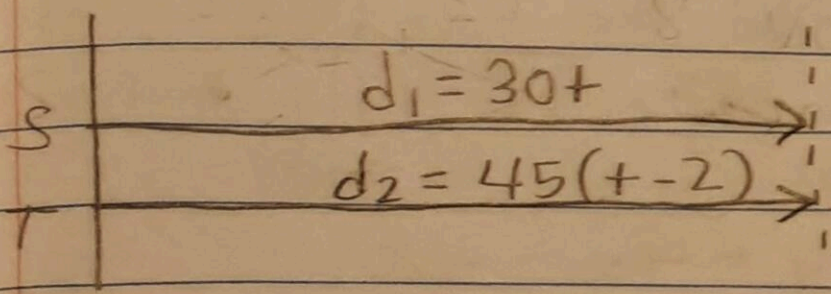
$A = s^2 = 12^2 = \boxed{144 \text{ cm}^2}$

(79) Rate / Distance: Catch Up Word Problems

Ex: Sally left her home at 11 A.M., traveling along Route 1 at 30 mph. At 1 p.m., her brother Tom left home and started after her on the same road at 45 mph. At what time did Tom catch up to Sally.

Formula: $d = r \cdot t$

1) Draw a diagram



2) use the word problem to complete diagram.

3) Use the formula, $d_1 = d_2$, and plug it in the info.

4) Solve: $30t = 45(t-2)$

$30t = 45t - 90$

$-15t = -90$

$t = 6$

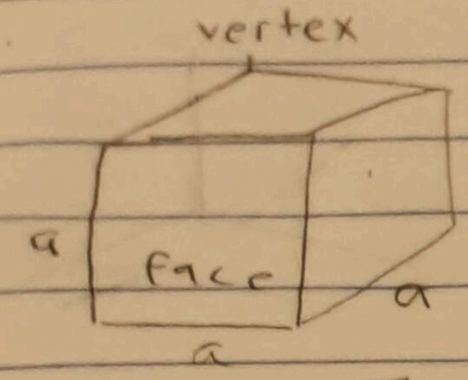
5) Use Sally's time that she left and add 6 hours

11 A.M. + 6 hours = 5 P.M.

(80) Cube

A cube is a 3D solid with 6 square faces

- has 6 faces
- has 12 edges
- has 8 vertices
- all faces are congruent squares

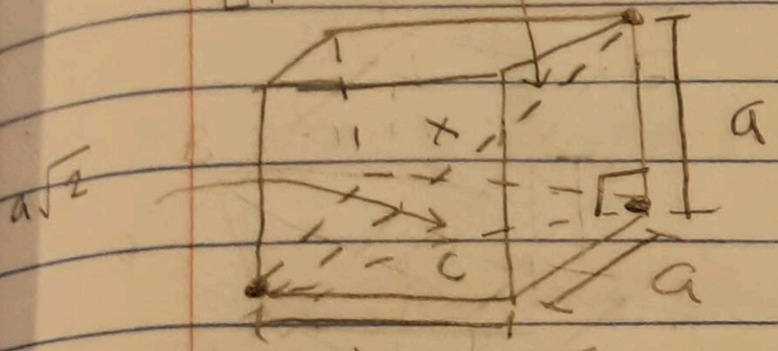


$a\sqrt{2}$

$a^2\sqrt{2}$

$a\sqrt{3}$

EX:



① use the pythagorean theorm to solve

$2a^2 = c^2$

Sq. root it → $c = \sqrt{2a^2}$

$\sqrt{2a^2} = a\sqrt{2}$

$a^2 + (a\sqrt{2})^2 = x^2$

$a^2 + 2a^2 = x^2$

Sq. Root → $3a^2 = x^2$

$x = a\sqrt{2}$

(81) Fractional Exponets

Ex: $8^{\frac{2}{3}}$

To solve this, split the number into two parts

Make it like this: $[8^{\frac{1}{3}}]^2$ Raise it.

The cube root of 8 is 2

$2 \times 2 = 4$ Take the two and square the two

$8^{\frac{2}{3}} = 4$

Ex 2: $16^{\frac{5}{4}}$

$[16^{\frac{1}{4}}]^5$

Fifth power of 16 is 2

$2^5 = 32$

$16^{\frac{5}{4}} = 32$

Shortcuts

Divisibility Shortcut

Ex: Is the number 45,942 divisible by 3?

To do this, add up each digit in the number.

$4+5+9+4+2=24$

Then divide the sum by the number needed to be divided by.

$$\begin{array}{r} 8 \\ 3\overline{)24} \\ -24 \\ \hline 0 \end{array}$$

Answer: Yes; 45,942 is divisible by 3.

Finding LCM shortcut

Cake method

Ex: Find the LCM of 15 and 18

5	5, 1
3	5, 3
3	15, 9
2	15, 18

You can only divide by prime #'s. If you cannot divide the number, put the undividable on the top.

$5 \times 3 \times 3 \times 2 = 90$

LCM of 15 and 18 is (90)

(83) Currency Exchange Word Problems

Ex: 2 poros = 5 grooks
2 grooks = 3 peers
3 peers = 1 zom

What is the highest valued currency?
zom is the highest valued currency.

To solve this very fast, elimnate the highest valued currency from top to bottom.

2 poros = ~~5 grooks~~ ← elimnate grooks
2 grooks = ~~3 peers~~ ← elimnate peers
~~3 peers~~ = 1 zom ← elimnate peers again
Then, start over again from top to bottom.
~~2 poros~~ = ~~5 grooks~~ ← elimnate poros
~~2 grooks~~ = ~~3 peers~~ ← elimnate grooks
~~3 peers~~ = (1 zom) ← Don't elimnate zom since it is the last one standing, therefore it is the highest valued currency.

English

① Comma Splices

A comma splice contains two clauses (a subject and verb) incorrectly joined by a comma.

EX: I am sleepy, I have to go to work.
↑ Comma Splice

② Sentence Fragments

A fragment does not contain a main clause (no subject and no verb and a complete thought) If missing one or two of these, a Fragment happens.

EX: And yawned loudly enough to make everyone in class turn around

verb = yawned, no subject, no complete thought

Ex: The boy sitting on the fire escape, dropping water balloons on the pedestrians below

no verb, Subject = boy, no complete thought

To fix a fragment, add the required parts of a clause or connecting the fragment to a main clause already in the passage.

② Subordinate Clause Fragments

A fragment like this one will begin with a subordinate conjunction or a relative pronoun.

The subordinate conjunction provides a necessary transition between the two ideas in the sentence. This transition will indicate a time, place, or cause and effect relationship.

Ex: Because her teeth were chattering in fear, Lynda clenched her jaw muscle while waiting for her turn to audition.

Secondly, the subordinate conjunction reduces the importance of one clause. The more important idea belongs in the main clause, the less important in the clause introduced by the subordinate conjunction.

Ex: Ronnie sneezes violently whenever he opens the door to greet a fresh day.

Sneezing violently $\xrightarrow[\text{when}}$ opening the door

It cannot be a sentence, therefore it is a fragment.

EX: Only to watch in dismay as Professor Frazier poured her chemistry experiment into the sink.

⑤ Afterthought Fragments

An afterthought clarifies earlier information by providing specific details. If it does not have a main clause, it is a fragment. Usually, transition words appear alot in these types of fragments.

For example leaky pens, candy wrappers, dollar bills, and paperclips.

⑥ Lonely Verb Fragments

Lonely verb fragments happens when there is no subject in the sentence. Often, it can recongized when it starts with a coordinating conjunction (and, but, for, or, nor, so, yet) You will need to find the subject in the fragment if it is really a lonely verb fragment.

EX: And dashed through the downpour as raindrops soften the hairspray shell holding her elaborate coif in place.

(7) Appositive Fragments

An appositive is a noun phrase that renames and clarifies another noun. By itself, an appositive is a fragment.

It will begin with a noun and usually include one or more clarifying phrases or even a subordinate clause after it.

Your friend Bill is in trouble
(pro)noun → Appositive

(8) fixing fragments

Subordinate Clause

You can just remove one word in order to make this into a sentence.

Because Chase caught the eye of the beautiful brunette in algebra

To fix this, simply remove "because" to make it a complete sentence.

To fix Subordinate Clause Fragments put a comma between the main clause and subordinate clause.

put comma ↓

We will continue giggling until Rachel notices the toilet paper stuck to her shoe.

To fix participle phrase fragments is to add the necessary main clause.

Sunning themselves on the hot concrete until they heard human feet crashing down the sidewalk.

Correction:
The little lizards were sunning themselves on the hot concrete until they heard human feet crashing down the sidewalk.

→

Fixing Infinitive Phrase Fragments

To fix this, add a subject and Combining the verb.

Only to watch in dismay as Professor Frazier poured her chemistry experiment into the sink.

We don't know who is watching Professor Frazier so you add in the subject

Correction: Amber watched in dismay as Professor Frazier poured her chemistry experiment into the sink.

Fixing Afterthought Fragments

There are 2 ways to fix it.

1) Insert the missing subject and verb, so it becomes a main clause. Works best when the fragment starts with a "for example" or "for instance"

EX: For example, leaky pens, candy wrappers, dollar bills, paperclips

Correction: For, example, the desk drawer contained leaky pens, candy wrappers, dollar bills, and paperclips

2) You can attach the afterthought fragment to the end of a main clause. Works well when the fragment with, "expect", "excluding", "including", "like", and "such as".

Ex: John has many unsafe habits, such as leaving the stove on and teasing mean dogs.

Fixing Lonely Verb Fragments

Add the subject.

And dashed through the downpour as raindrops softened the hairspray shell holding her elaborate coif in place.

Correction: Betty dashed through the downpour as raindrops softened the hairspray shell holding her elaborate coif in place.

Fixing Appositive Fragments

There are two options when fixing an appositive fragment. Since an appositive contains a noun - which can conviently become a subject - adding a verb will often fix the problem.

Ex: The unprepared student who was always begging for an extra pencil and a couple sheets of blank paper. (Sneezed)

In order to correct this, simply add a verb at the end of the sentence.

Another way is to connect the appositive to a main clause.

Ex: A slacker wasting his afternoon in front of the television, Brian opened a bag of potato chips instead of his chemistry textbook.

Correction: Brian, a slacker wasting his afternoon in front of the television, opened a bag of potato chips instead of his chemistry textbook.

③ Participle Phrase fragments
These fragments usually begin with a word ending ing or ed. When paired with irregular verbs, an irregular past participle like broken or swum will begin the phrase. Modifiers and objects may follow, but there is no main clause.

Ex: (Sunning) themselves on hot concrete until they heard human feet crashing down the sidewalk.

(Sucked) down the pipe with a hearty slurp.

(Hidden) in the bureau drawer underneath a pile of mismatched socks.

④ Infinitive phrase Fragments
An infinitive phrase fragment will begin with to followed by the base form of the verb, like this:

[TO] + [VERB] = Infinitive

Subordinate Conjunctions

after	in case	that
although	in order that	though
as	insofar as	till
as if	just as	unless
as long as	no matter how	until
as soon as	now that	when
as though	once	whenever
because	provided that	where
before	rather than	whereas
even if	since	wherever
even though	so that	whether
how	than	while
if		why

Relative Pronouns

that	who	whose
which	whoever	whosever
whichever	whom	whomever

(9) Irregular Verbs

Infinitive	Simple Present	Simple Past	Past Participle	Present Participle
to laugh	laugh(s)	laughed	laughed	laughing
to start	start(s)	started	started	starting
to wash	wash(es)	washed	washed	washing
to wink	wink(s)	winked	winked	winking
to drive	drive(s)	drove	driven	driving
to swim	swim(s)	swam	swum	swimming

Iregular verbs can be found when there is an incorrect -ed to the end of the past tense or part participle. It can also happen when the writer confuses one form with the other.

(10) Parallel Structure

Whenever you include a list of actions or items, you must use equal grammatical units. If the first item is a noun, then the following items must also be nouns; if the first action is a simple past tense verb, then make the other items simple past terse verbs too.

Nonparallel structure looks like this:
Students capped their pens, were closing, and zipped their book bags as they tried to alert Professor Jones, rambling at the lectern, that the end of class had arrived.

Capped and zipped are both simple past tense verbs, but were closing is past progressive, wrecking the parallelism.

To establish parallelism, you can use simple past tense verbs:
Students capped their pens, closed their notebooks, and zipped their book bags as they tried to alert Professor Jones, rambling at the lectern, that the end of class had arrived.

Or you can revise the sentence so that all the items in the list are nouns:
Students gathered their pens, notebooks, and book bags as they tried to alert Professor Jones, rambling at the lectern, that the end of class had arrived.

Be careful with correlative conjunctions. These will need SPECIAL attention when proofreading.

"Not only", "But also", "Either", "Or", "Neither", "Nor", all of these correlative conjunctions require equal grammatical units for both parts of the conjunction.

For instance, you can have two main clauses like this:

Not only did Professor Jones give the students a withering look, but he also assigned 20 extra pages of homework as punishment for their impatience to leave.

These transition words are defined as parallelism for most sentences.

(11) Dangling Modifiers

Modifiers are words, phrases, or clauses that add description. In clear, logical sentences, you will often find modifiers right next to - either in front of or behind - the target words they logically describe.

EX: Horrified, Mom snatched the deviled eggs from Jack, whose fingers were covered in cat hair.

Notice that horrified precedes Mom, it's target, just as deviled sits right before eggs. Whose fingers were covered in cat hair immediately follows Jack, its target.

Ex. Hungry, the leftover pizza was devoured.

Hungry is a single-word adjective. Notice that there is no one in the sentence for this modifier to describe.

To fix a dangling modifier, it will require more than just rearranging words in the sentence. You would often need to add something new, so that the modifier finally has a target word to describe.

Hungry, (we) devoured the leftover pizza.

(12) Misplaced Modifiers

Modifiers that are modifying the wrong thing and misplaced.

EX: Gazing out the window, Paul missed the homework assignment that Professor Zuromski wrote on the board.

Gazing out the window is a participle phrase describing Paul, the noun that follows.

EX: Churning in the Atlantic Ocean, we anxiously watched the weather report for information about the hurricane.

Churning in the Atlantic Ocean is a participle phrase.

It is describing the pronoun, we. It is illogical and we cannot churn in an ocean.

To fix a misplaced modifier, locate the modifier next to the appropriate word.

We anxiously watched the weather report for information about the hurricane churning in the Atlantic Ocean.

(13) Apostrophes

The apostrophe is used:

1) to show possession
2) make contractions
3) form odd plurals

Apostrophes are not needed for possessive pronouns.

Use the apostrophe to make words possessive.

The doughnut belonging to Vince → Vince's doughnut

The hot sports car owned by Sylvia → Sylvia's hot sports car.

The home of the Watsons → The Watsons' home

When a noun does not end in s, add an apostrophe and a s at the end of the noun

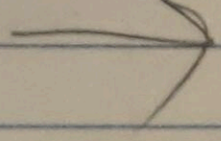
The lollipop belonging to Elena = Elena's lollipop

Nouns that do end in s that is plural, simply need an apostrophe at the end of the noun.
EX: The dogs' leashes

Nouns that end in a s that is singular require an apostrophe and a s.

EX: The bad luck that plagues Odysseus = odysseus's bad luck

If the extra syllable sounds unnatural, simply add the apostrophe



Use the apostrophe to make contractions.

The apostrophe indicates when a writer has combined two or more words into a single word.

EX: Cannot = Can't

Does not = Doesn't

Let us = Let's

Use the apostrophe to make odd plurals

Whenever you have plural lowercase letters, use the apostrophe + s to make the letters plural.

EX: Grandma prefers to sign birthday cards with (k's) and (h's) instead of (x's) and (o's)

If you have capital letters, use the letter s.

EX: David has two (BAs) - one in art history and the other in classical studies - but no job.

To avoid confusion, the apostrophe + s works on a few letters.

Look at all those (I's) in your project summary. You did have two other teammates, right?

Kevin earned only three (A's) this semester, missing a 4.0 because of one missed question on Professor Grayson's final exam.

Numbers

To make numbers plural, use a s at the end of the number.

Ex: To escape the high 90(s) in town, we drove to the beach to enjoy the cool ocean breeze.

(14) Commas
used when:

1) Seperate independent clause when joined by these coordinating conjunctions: and, but, for, or, nor, so, yet

Ex: He walked down the street ① and then he turned the corner.

2) use a comma after an introductory clause or phrase.

Ex: When Evan was ready to iron ② his cat tripped on the cord.

3) use a comma between all items in a series

Ex: we bought apples, peaches, and bananas today. (series of words)

4) Use commas to enclose clauses not essential to the meaning of a sentence. (nonessential clauses = nonrestrictive)

EX: Steven Strom, whose show you like, will host a party next week. (nonrestrictive)

5) use a comma to set off appositives

Appositives offer nonessential information. Nonrestrictive appositives are set off with commas; restrictive appositives are not

EX: Alexander Pope, the Restoration poet, is famous for his monologues. (appositive)

EX: The poet Pope is famous for his monologues. (no appositive)

6. Use a comma to indicate direct address

When a speaker in a sentence names the person to whom he is speaking, this addressing of his audience is called direct address.

→

EX: I think, John, you're wrong
EX: John, I think you're wrong
EX: I think you're wrong, John.

7) Use commas to set off direct quotations

EX: Mary said; "I dislike concerts because the music is too loud."

8. Use commas with dates, addresses, titles, and numbers

Dates ex: On December 12, 1890, orders were sent out for the arrest of Sitting Bull.

Address ex: John Lennon was born in Liverpool, England, in 1940.

Title ex: Sandra Belinsky, MD, has been appointed to the board.

Numbers ex: 3,500; 100,000; 6,000,000

(15) Formality and Style

Ex: Gary Evans, the esteemed chairman of the board, is a pretty decent dude

↑ slang style

(must replace)

Ex: Gary Evans, the esteemed chairman of the board, is a renowned philanthropist.

↑ more appropriate

↑ loves people

Ex: Please join us for Little Philips first birthday celebration! This festive occasion will include an abundance of delightful diversions in which you can partake.

↑ Too formal

↻ tailor content to its CONTEXT

Correction: ↘

Please join for Lil Philip's first birthday party! It's going to be fun we'll have cake and games! Let us know if you can make it.

Informal ← → Formal

Silly words, Contractions, (Can't) slang, ("Yo buddy!") profanity

VOCABULARY

(cannot) ("Excuse me, sir!")

Complex, Specialized Vocab, Full constructions, more respectful address

Consider your context!!!

(16) Types of sentences

There are three types of sentences

1) Declartive - makes a statement: facts or an opinion.
EX: It is a beautiful day. Lavender hated baseball.
2) Interrogative - asks a question
EX: Where did you go last night?
3) Imperative - a command
EX: Follow that bunny!

(17) Subject and Predicate

Ex: [I] | bought a crate of goblin hats.

subject ↑ predicate

who? what's happening?

Subject: noun or pronoun that performs a verb in a sentence

Predicate: the verb and the rest of the sentence

(18) Pronoun Use

Pronouns alters its meaning to match the nearby antecedent (the word, phrase, or clause that a pronoun can replace)

Ex: Jeff told me he ate lunch. Jeff = he

Possessive nouns function as adjectives.

A possessive noun should not be the antecedent for a pronoun.

Ex: Kevin's fingers were strumming the guitar when he winked at Donna.

In this sentence, it is shown that Kevin's fingers were winking at Donna. But, that does not make sense at all!

(19) Pronoun Agreement

Whenever you use a personal pronoun like she, it, or they, you first must establish its antecedent, the word that the pronoun is replacing.

Correlative Conjunctions confuse pronoun agreements.

Exercise caution when you use correlative conjunctions like either, or, neither, nor, not only, and but also. Correlative conjunctions present pairs, you will find two separate antecedents.

Ex: Not only the handpicked flowers but also the homemade peanut butter pie will win Briana's heart with its thoughtfulness.

The two antecedents, the homemade peanut butter pie (singular) and the handpicked

flowers (plural).

Singular indefinite pronouns cause problems. Indefinite pronouns, a special class of words, will often be antecedents for personal pronouns. Some indefinite pronouns are singular and will often require a singular pronoun for agreement.

Ex: Each, either, neither, one, anybody, anyone, anything, everybody, everyone, everything, nobody, no one, nothing, somebody, someone, something

Not all indefinite pronouns are strictly singular. Another group of indefinite pronouns is singular or plural, depending on the information from the prepositional phrase that follows.

Ex: all, any, none, most, some

(20) Author's Purpose

An author's purpose is his/her reason for writing.

There are 5 types

1. Persuade - To convince or make you do something

Ex: Coco Cola advertisment asking you to buy Coke

2. Inform - To tell information about something or someone

Ex: The author informing about fish's skeleton.

3. Entertain - Make the reader laugh or enjoy

Ex: Fiction stories

4. Explain - explain how to do something step by step

Ex: How to make a cake manual

5. Describe - Tell about something using senses and details (5 senses: feel, hear, see, smell, taste)

Ex: The red blanket smells like rotten eggs.

(21) Colon (:)

Colons can link phrases or clauses when they have both have strong connections.

Ex: Both movies are great, but Sky Pal has one thing that makes it better: dogs that play sports.

The colon serves as a connection bewteen both sentences.

A colon can also introduce a list of things

Ex: We needed to find three more items on the scavenger hunt: a four-leaf clover, a cauldron, and an abandoned ship.

→

Colons can also introduce items.

EX: I only wanted one thing from the grocery store: peanuts.

Lastly, colons can introduce quotes.

EX: My friend Liz says it best: "Never open a jar of pickles you can't close."

(22) Semicolon (;)

Semicolon can link ideas in a sentence with many commas.

EX: Semicolons: At first, they may seem frightening(;) then, they become enlightening(;) finally, you'll find yourself falling for these delightful punctuation marks.

Best used before a transition word with a similar idea

It can also link independent clauses

Ex: This building is broken; it is old.

Semicolons, unless being used in lists, semicolons should connect clauses that are related in some way.

Semicolons are never used before coordinating conjunctions: and, but, for, nor, so, yet, or,

However, a semicolon can replace a conjunction to shorten a sentence or to give the sentences some variety.

(23) Dashes

Dashes are used to interrupt structure of a sentence.

Ex: I ran to the bus stop — but the bus had already driven away.

The dash stops the sentence like pausing it.

Secondly, the dash can act like a parentheses in pairs.

Ex The bug—which landed on my nose—had to be the size of a softball.

Thirdly, the dash can be used like a colon.

Ex: I have only ever wanted one thing—snacks.

Fourthly, dashes indicates interruptions in speech

Ex "Watch out for that—" WHAM.

"will be eaten" is future tense

Mary will eat the pizza

"will eat" is also future tense.

(25) Comparitive and Superlative

Comparitives are adjectives that compare only two things

EX: This show is better than the book.

Usually you would add -er to the adjective when comparing 2 things. Add -est when comparing 3 or more things

EX: This is the biggest book than the other 50 books.

There are expections such as when an adjective is more than 3 syllables, we add more and most!

Ex: She is ~~more responsible~~ than her younger sister.

Some words don't follow any rules at all. You just replace with another adjective

good ~~gooder~~ good - better = best

Superlative adjective means to describe the best out of best or the worst out of worse. You use the word, most, in this case.

Ex: He is the most happiest out of you three.

(26) Point of View

There are some points of view used for narrating text.

First person ("I", "me", "we")

Mainly used for narratives and autobiography.

Ex: (I) always look foward to my summer vacation at the beach. (I) like to collect seashells.

Second person ("you", "your", "yours)
Mainly used for songs, speeches, and advertisements.

EX: In just a few simple steps you can make a big change in your life!

Third person Omniscient
Can tell the reader what anyone is doing including their thoughts

EX: While Bob was planning a special night out with Millicent, she was quietly making plans to break up with him. All of their friends would be shocked to discover her plans.

Third person Multiple
Showing different points of view throughout the story

EX: Ed's teacher knew how much potential the teenager had, but the reality is that he just was not interested in school. He had too many obligations at home.

Third person Limited
Can only show one character's thoughts

EX: He knows that he is a great football player. He is proud to have scored the most touchdowns this season.

(27) Simile and Metaphor
Similes compares two different things with the words, "like" or "as".

EX: "He is busy (as) a bee."

EX: "She is like a fox."

Metaphors are the same as similes expect they don't use "like" or "as".

EX: "Love is a battlefield"

EX: "Bob is a couch potato."

(28) Verbs

Verbs are the action in a sentence.

EX: run, jump, hit, kick

Action Verbs

Action verbs express action (give, eat, walk, etc) or possession (have, own, etc.) Action verbs can be either transitive or intransitive.

Transitive Verbs

Has a noun that recieves the action of the verb, called the direct object.

EX: Laurissa (raises) her hand

Verb = raises Direct object = her hand.

Indirect Object is the object to whom or for whom the action was done.

EX: Abdus (gave) Becky the pencil.

Verb = gave Direct object = pencil Indirect Object = Becky

Intransitive Verb

An intransitive verb has no direct or indirect object. Although it may be followed by an adverb, there is no object to receive its action.

Ex: Laurissa (rises) slowly from her seat.
Verb = rises The phrase, slowly from her seat, modifies the verb, but no object recieves the action.

Linking Verbs

Connects the subject of a sentence to a noun or adjective that describes the subject.

Ex: Jason became a business major.
Verb = became Noun = a business major

Helping Verbs

used before action or linking verbs to say more info about possibility (can, cloud, etc.) or time (was, did, has, etc.)

Ex: Teju (Is) (helping verb) (going) (main verb) to Flordia.

(29) Facts vs Opinions vs Arguments

Facts are statements that can be proven true or false.

EX: This cow has four stomachs.

Opinions are expressions of feelings that cannot be proven.

EX: I like this delicous steak.

Arguments are a set of statements one makes to prove a conclusion.

EX: Cats can make meow sounds, I think meow sounds are annoying, therefore cats are annoying.

(30) Cause and Effect

The cause happens first and tells us "why" it happened.

The effect comes after the causes and tells us "what" happened.

EX: It rained. Carolina got wet.

↑ Cause ↑ Effect

EX: Phil stayed up late. Phil was tired in the morning

↑ Cause ↑ Effect

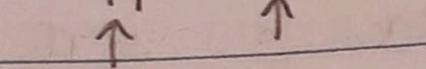
Transition words may signalify a cause and effect in a text.

EX: so, therefore, if, because, then, due to, thus, since, as a result, consequently

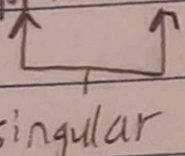
(31) Subject-Verb Agreement

The subject and the verb must be in the same singular or plural form.

EX: The apple fall.



Correction: The apple falls.



If the noun does not have a (s) at the end, the verb should have a (s) instead.

If the noun has a (s) at the end, the verb should be singular (no (s)).

(32) Author's Craft

The author's craft are the skills and techniques, authors use to create a piece of writing.

Allusion

A brief and indirect reference to anything or anyone important

Ex: She felt like she had a golden ticket.

The golden ticket refers to the golden ticket from Willy Wonka.

Irony

There are 3 types of irony: dramatic, situational, and verbal.

Dramatic irony - Let the reader know something that a character does not.

EX: The boy dies but, the girl does not know that he faked his death.

Situational irony - When an expected outcome doesn't happen but, the opposite happens.

EX: I was expecting today to be sunny, but it was raining.

Verbal irony - The speaker who is saying a statement means something else instead of being taken literally.

EX: A man stepping outside into a hurricane saying, "What nice weather we are having!"

Imagery

The author uses specific words to create powerful images in the reader's mind. The author often uses the five senses for imagery.

EX: Her lips tasted as sweet as sugar.

Taste, being one of the five senses, is being used in this imagery to show how sweet her lips are.

Foreshadowing

A warning or indication of a future event in the story.

Flashback

A jump back in time during the story, often to provide the reader with important background information about a character or past event.

Cliffhanger

When the author abruptly ends the story with an open-ended ending.

Repetition

Repeated words to make it more emphaized as an important message.

EX: (I) see that you've repeated by saying: "You are your very friend that (I) and only (I) can be."

"I" is repeated throughout the sentence.

Symbolism
An object or action that means something more than its literal meaning.

EX: A rainy day often means a bad or hard times

Onomatopoeia
When a word like what it means.

EX: Crash, buzz, thump, bang

Hyperbole
An exaggerated comment or line

EX: I've told you that a million times

Personification
Gives any non-human thing a trait or quality of a human

EX: The calm sea kissed the southern shore

Tone

Reflects the writer's attitude toward the reader. By using the tone, it tells the reader of the author's intention and meaning in the text.

Ex: nostalgic, regretful, joyful, envious, etc.

Mood

The atmosphere of the narrative. The mood is created through the setting, attitude, and descriptions. It is gradually shown throughout the text.

Ex: Cheerful, reflective, gloomy, humorous, etc.

Theme

The true meaning or message of the story, what is the author trying to communicate to his or her readers?

Ex: love, war, crime, liberty, resist, etc.

(33) Sequencing

Sequence is putting the events in a story in the order in which they took place.

Transition words can help figure out the sequence of the narrative.

EX: In the (beginning), I put the flour, sugar, butter, and eggs

(Afterwards), I whisk all the ingredients together and put the batter in a pan.

(Then), I put it in the oven to bake for 30 minutes.

(Finally), I decorate the cake with frosting.

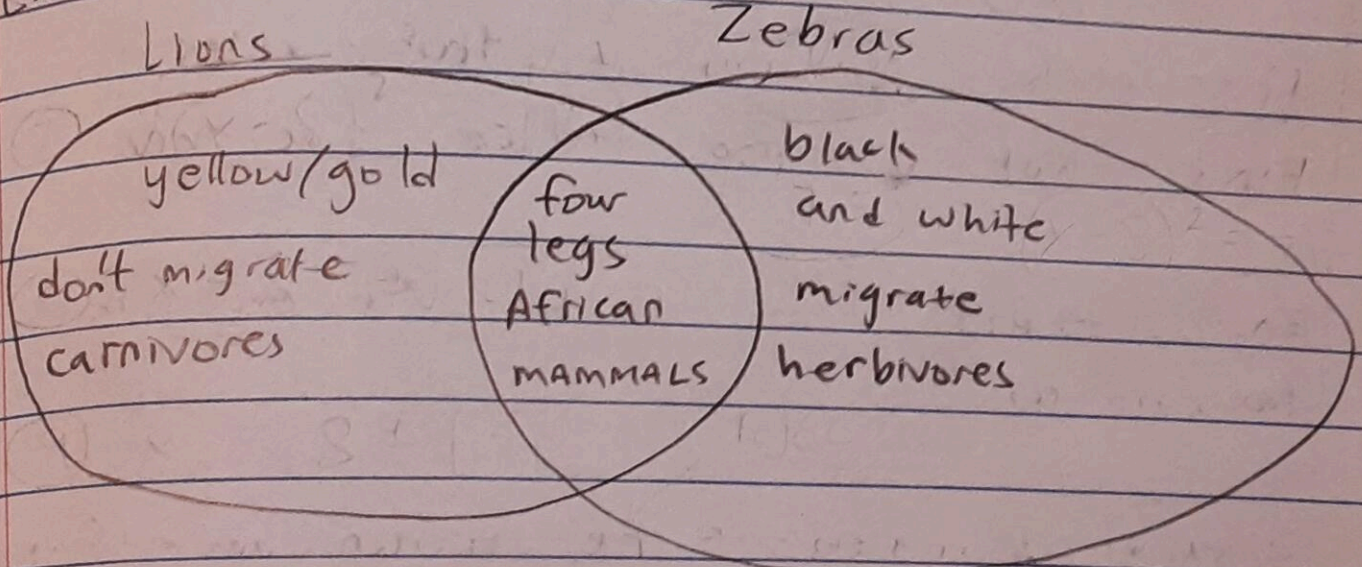
(34) Compare and Contrast

Comparing and contrasting helps us to organize information more efficently.

Compare - Identify similarities between two or more things

Contrast - Identify differences between two or more differences.

EX: Venn diagram



Compare Transitions: also, too, similar, similarly, alike, both, same, in the same way

Contrast Transitions: however, differ, but, in contrast, whereas, different, on the other hand

EX: Zebras are herbivores, (whereas) lions are carnivores.

(35) Poetry

Old words and has some subgenres

Haiku - 5 syllable → 7 syllable → 5 syllable

Often focuses on nature and moments in life

Ex: Sick on a journey (5)
Over parched field (7)
Dreams wander on (5)

Free Verse - No set of specified rules

Find what is suppose to say and mean

Ex: I buried my father in my heart.
Now he grows in me, my strange son,
My little root who won't drink milk,
Little pale foot sunk in unheard-of-night,
Little clock spring newly wet
In the fire, little grape, parent to the future
Wine, a son the fruit of his own son
Little father I ransom with my life

Epic - Long and narrative poem that normally tells a story about a hero or an adventure.

EX: By the shore of Gitchie Gumee,

By the shining Big-Sea-Water,

At the doorway of his wigwam,

In the pleasant Summer morning,

Hiawatha stood and waited.

Ballad - Also tells a story but often based on a legend or a folk tale. These poems may take form of songs, or they may contain a moral or a lesson.

Ex: Oh the ocean waves may roll,
And the stormy winds may blow,
While we poor sailors go skipping aloft
And the land lubbers lay down below, below, below
And the land lubbers lay down below.

Sonnet - 14-line poem that follow a specific rhyme scheme, depending on the sonnet. It will also have an iambic pentameter.

EX: Let me not to the marriage of true minds (A)
Admit impediments. Love is not love (B)
Which alters when it alteration finds, (A)
Or bends with the remove to remove. (B)
O no! it is an ever fixed mark (C)
That looks on tempests and is never shaken; (D)
It is the star to every wand'ring bark, (C)
Whose worth's unknown, although his height be taken. (D)
Love's not Time's fool, though rosy lips and cheeks (E)
Within his bending sickle's compass come; (F)
Love alters not with his brief hours and weeks, (E)
But bears it out even to the edge of doom. (G)
If this be error and upon me prov'd, (H)
I never writ, nor no man ever lov'd. (H)

Narrative Poem - Tells a story with a plot, setting, and characters. Has rhyme and meter and uses action and dialogue.

EX: On the Mountains of the Prairie,
On the great Red Pipe-stone Quarry,
Gitche Manito, the mighty,
He the Master of Life, descending,
On the red crags of the quarry
Stood erect, and called the nations,
Called the tribes of men together.

Elegy - Reflects upon death or loss. Usually contains themes of mourning, loss, and reflection. However, it can explore themes of redemption and consolation. It has 4 lines and ABAB rhyme scheme and each line is written in iambic pentameter.

EX: O Captain! my Captain! our fearful trip is done, The ship has weather'd every rack, the prize we sought is won, The port is near, the bells I hear, the people all exulting, While follow eyes the steady keel, the vessel grim and daring; But O heart! heart! heart! O the bleeding drops of red, Where on the deck my captain lies, Fallen cold and dead

Blank poem - Blank poems have a strong metrical pattern and written with almost always iambic pentameter. Does not rhyme at all.

Ex: Like to an almond tree-y mounted
high Upon the lofty and celestial mount
Of evergreen
Selinus, quaintly deck'd With blooms
more white than Erycina's brows, Whose tender
blossoms tremble every one At every little
breath that thorough heaven

Limerick - 5-line poem with only 1 stanza, AABBA rhyme scheme. It is a short, concise, expressive tale or description. Some are funny or mean, and nearly all are trivial in nature. It also rhymes the 1st time on first, second, and fifth lines. It rhymes again on the third and fourth lines.

EX: There was a Young Lady of Russia, (A)
Who screamed so that noone could hush her; (A)
Her screams were extreme, (B)
No one heard such a scream, (B)
As was screamed by that lady of Russia. (A)

Ode - A short lyric poem that praises someone, an idea, or an event.

EX: There was a time when meadow, grove, and stream,
The earth, and every common sight
To me did seem
Apparelled in celestral light,
The glory and the freshness of a dream.
It is not now as it hath been of yore;
Turn wheresoe'er I may,
By night or day,
The things which I have seen I now can see no more.

The speaker here is praising common sight like the meadow, grove, and the stream.

Poetry Terms

Line - poem sentence

Stanza - Poem paragraph

Ryhme Scheme - the last word that rhymes with next ryhming last word on the lines

Ex: each rhymes with beach
If they were neighboring lines, it would be AA.

Alliteration - Repeating initial consonant sounds in words.

Ex: (S)he (s)ells (s)eashells down by the (s)eashore.

Assonance - Repeating vowel sounds in words

Ex: The ra(i)n (i)n Spa(i)n ma(i)nly (i)n the pla(i)ns.

Consonance - Repeating consonant sounds

Ex: She (g)ave the bi(g) do(g) a hu(g).

Couplet - A pair of lines in poetry of a similar length that rhyme

EX: Tell me if you think you know
How to make a turtle go